August 23, 1974 17

GOVERNMENT REPORTS ANNOUNCEMENTS

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INDEXES. Corporate Author, Subject, Personal Author, Contract Number, and Accession/Report Number Indexes are published in the corresponding issue of Government Reports Index (GRI).

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Frederick B. Dent, Secretary

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Announcements in this journal are arranged in the 22 subject fields recommended in the Committee on Scientific and Technical Information (COSATI) Subject Category List (AD-612 200). Each field is subdivided into groups.

A 'Locator List' at the end of the journal gives the COSATI field and group location for each report cited in the issue. This list is arranged alphanumerically by accession number. An 'Edge Index' on the back cover provides easy access to the subject fields within the journal.

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SUBJECT FIELD AND GROUP STRUCTURE

(Use Edge Index on back cover to locate subject field in the journal)

FIELD 1. AERONAUTICS. Includes the following Groups: Aerodynamics; Aeronautics; Aircraft; Aircraft Flight Control and Instrumentation; Air Facilities.

FIELD 2. AGRICULTURE. Includes the following Groups: Agricultural Chemistry; Agricultural Economics; Agricultural Engineering; Agronomy and Horticulture; Animal Husbandry; Forestry.

FIELD 3. ASTRONOMY AND ASTROPHYSICS. Includes the following Groups: Astronomy; Astrophysics; Celestial Mechanics.

FIELD 4. ATMOSPHERIC SCIENCES. Includes the following Groups: Atmospheric Physics; Meteorology.

FIELD 5. BEHAVIORAL AND SOCIAL SCIENCES. Includes the following Groups: Administration and Management; Documentation and Information Technology; Economics; History, Law, and Political Science; Human Factors Engineering; Humanities; Linguistics; Man-machine Relations; Personnel Selection, Training, and Evaluation; Psychology (Individual and Group Behavior); Sociology.

FIELD 6. BIOLOGICAL AND MEDICAL SCIENCES. Includes the following Groups: Biochemistry; Bioengineering; Biology; Bionics; Clinical Medicine; Environmental Biology; Escape, Rescue, and Survival; Food, Hygiene and Sanitation; Industrial (Occupational) Medicine; Life Support; Medical and Hospital Equipment; Microbiology; Personnel Selection and Maintenance (Medical); Pharmacology; Physiology; Protective Equipment; Radiobiology; Stress Physiology; Toxicology; Weapon Effects.

FIELD 7. CHEMISTRY. Includes the following Groups: Chemical Engineering; Inorganic Chemistry; Organic Chemistry; Physical Chemistry, Radio and Radiation Chemistry.

FIELD 8. EARTH SCIENCES AND OCEANOGRAPHY. Includes the following Groups: Biological Oceanography; Cartography; Dynamic Oceanography; Geochemistry; Geodesy; Geography; Geology and Mineralogy; Hydrology and Limnology; Mining Engineering; Physical Oceanography; Seismology; Snow, Ice, and Permafrost; Soil Mechanics; Terrestrial Magnetism.

FIELD 9. ELECTRONICS AND ELECTRICAL ENGINEERING. Includes the following Groups: Components; Computers; Electronic and Electrical Engineering; Information Theory; Subsystems; and Telemetry.

FIELD 10. ENERGY CONVERSION (Non-propulsive). Includes the following Groups: Conversion Techniques; Power Sources; Energy Storage.

FIELD 11. MATERIALS. Includes the following Groups: Adhesives and Seals; Ceramics, Refractories, and Glasses; Coatings, Colorants, and Finishes; Composite Materials; Fibers and Textiles; Metallurgy and Metallography; Miscellaneous Materials; Oils, Lubricants, and Hydraulic Fluids; Plastics; Rubbers; Solvents, Cleaners, and Abrasives; Wood and Paper Products.

FIELD 12. MATHEMATICAL SCIENCES. Includes the following Groups: Mathematics and Statistics; Operations Research.

FIELD 13. MECHANICAL, INDUSTRIAL, CIVIL, AND MARINE ENGINEERING. Includes the following Groups: Air Conditioning, Heating, Lighting, and Ventilating; Civil Engineering; Construction Equipment, Materials, and Supplies; Containers and Packaging; Couplings, Fittings, Fasteners, and Joints; Ground Transportation Equipment; Hydraulic and Pneumatic Equipment; Industrial Processes; Machinery and Tools; Marine Engineering; Pumps, Filters, Pipes, Fittings, Tubing, and Valves; Safety Engineering; Structural Engineering.

FIELD 14. METHODS AND EQUIPMENT. Includes the following Groups: Cost Effectiveness; Laboratories, Test Facilities, and Test Equipment; Recording Devices; Reliability; Reprography.

FIELD 15. MILITARY SCIENCES. Includes the following Groups: Antisubmarine Warfare; Chemical, Biological, and Radiological Warfare; Defense; Intelligence; Logistics; Nuclear Warfare; Operations, Strategy, and Tactics.

FIELD 16. MISSILE TECHNOLOGY. Includes the following Groups: Missile Launching and Ground Support; Missile Trajectories; Missile Warheads and Fuses; Missiles.

FIELD 17. NAVIGATION, COMMUNICATIONS, DETECTION, AND COUNTERMEASURES. Includes the following Groups: Acoustic Detection; Communications; Direction Finding; Electromagnetic and Acoustic Countermeasures; Infrared and Ultraviolet Detection; Magnetic Detection; Navigation and Guidance; Optical Detection; Radar Detection; Seismic Detection.

FIELD 18. NUCLEAR SCIENCE AND TECHNOLOGY. Includes the following Groups: Fusion Devices (Thermonuclear); Isotopes; Nuclear Explosions; Nuclear Instrumentation; Nuclear Power Plants; Radiation Shielding and Protection; Radioactive Wastes and Fission Products; Radioactivity; Reactor Engineering and Operation; Reactor Materials; Reactor Physics; Reactors (Power); Reactors (Non-power); SNAP Technology.

FIELD 19. ORDNANCE. Includes the following Groups: Ammunition, Explosives, and Pyrotechnics; Bombs; Combat Vehicles; Explosions, Ballistics, and Armor; Fire Control and Bombing Systems; Guns; Rockets; Underwater Ordnance.

FIELD 20. PHYSICS. Includes the following Groups: Acoustics; Crystallography; Electricity and Magnetism; Fluid Mechanics; Masers and Lasers; Optics; Particle Accelerators; Particle Physics; Plasma Physics; Quantum Theory, Solid Mechanics; Solid-state Physics; Thermodynamics; Wave Propagation.

FIELD 21. PROPULSION AND FUELS. Includes the following Groups: Air-breathing Engines; Combustion and Ignition; Electric Propulsion; Fuels; Jet and Gas Turbine Engines; Nuclear Propulsion; Reciprocating Engines; Rocket Motors and Engines; Rocket Propellants.

FIELD 22. SPACE TECHNOLOGY. Includes the following Groups: Astronautics; Spacecraft; Spacecraft Trajectories and Reentry; Spacecraft Launch Vehicles and Ground Support.

REPORTS & TRANSLATIONS

1. AERONAUTICS

1A. Aerodynamics

AD-780 600/3GA PC$4.50/MF$1.45
Virginia Polytechnic Inst and State Univ Blacksburg Dept of Aerospace and Ocean Engineering
HYPERSONIC VISCOUS-INVISCID INTERACTION WITH VECTORED SURFACE MASS TRANSFER.
Scientific rept.,
G. R. Inger, and T. F. Swean, Jr. Mar 74, 119p
Rept no. VPI-Aero-012 AFOSR-TR-74-0193
Grant AF-AFOSR-2173-72
Supersedes AD-775 098.

Descriptors: *Thrust vector control systems, *Injection, Hypersonic flow, Mass transfer, Heat transfer, Pressure gradients, Laminar boundary layer, Suction slots.

A fundamental theoretical study of homogeneous vectored injection and suction in high speed flows with heat transfer and self-induced gradients is described, based on local similarity solutions of the laminar boundary layer equations. The results show the important effects of both injection velocity and vector angle on a variety of physical properties of practical interest such as velocity and temperature profiles, skin friction, heat transfer rate, displacement thickness and induced pressure field. In addition, the existence of a new set of solutions pertaining to upstream-vectored injection is established and investigated. Moreover, it is shown that the frictional heating associated with the tangential injection velocity component can significantly influence the heat transfer characteristics of high speed flows. (Author)

AD-780 758/9GA PC$4.50/MF$1.45
David Taylor Model Basin Washington D C Aerodynamics Lab
EVALUATION OF AIRFOIL SECTION CHARACTERISTICS IN GROUND EFFECT.
Technical note,
Richard L. Schaeffer, and Martin D. Fink. Oct 65, 26p Rept no. TN-AL-2

Descriptors: *Airfoils, *Ground effect, Wings, Drag, Lift, Angle of attack, Wind tunnel models.

The test was begun as an attempt to provide design information on the section characteristics of wings in ground effect. It was found that this objective could not be achieved, so emphasis was shifted to defining trends in the data. The trends showed that profile drag increases as the ground is approached and that the increase is approximately a linear function of height above the ground.

AD-781 143/3GA PC$6.00/MF$1.45
Royal Aircraft Establishment Farnborough (England)
FURTHER WORK ON THE INTEGRATION OF CLOSED LOOPS SPECIFIED ONLY AS DISCRETE DATA POINTS.
Technical rept.,
D. S. Woodward. Apr 74, 59p Rept no. RAE-TR-73177 DRIC-BR-40651

Descriptors: *Airfoils, *Loads(Forces), *Computer programs, Pressure, Distribution, Subroutines, Integral equations, Curve fitting, FORTRAN, Great Britain.

The construction and use of a FORTRAN subroutine for evaluating the area and first moment of area of a closed loop are described. This subroutine has been used extensively for the evaluation of forces on aerofoils from measurements of their surface pressure distribution, and numerous examples are included. The subroutine is general enough to find applications wherever it is required to fit curves to discrete coordinate data defining a closed loop.

N74-21630/0GA PC$4.00
National Aeronautics and Space Administration, Washington, D.C.
AERONAUTICAL ENGINEERING: A SPECIAL BIBLIOGRAPHY WITH INDEXES, SUPPLEMENT 39.
Jan 74, 131p NASA-SP-7037(39)

Descriptors: *Aerodynamics, *Aeronautical engineering, *Bibliographies, Aeronautics, Aircraft design, Aircraft engines, Ground support equipment.

For abstract, see STAR 1213

N74-21631/8GA PC$4.50/MF$1.45
Kanner (Leo) Associates, Redwood City, Calif.
PROCESS AND DEVICE FOR ADAPTATION OF SHARP LEADING EDGE AIRFOILS TO ANY SPEED, SUBSONIC OR SUPERSONIC.
Apr 74, 27p NASA-TT-F-15569
Contract NASW-2481
Tran-Transl. Into English from French Patent No. 1071235 (19 Nov. 1952).

Descriptors: *Aerodynamic configurations, *Aircraft equipment, *Leading edge slats, *Sharp leading edges, *Wing planforms, Aerodynamic characteristics, Aircraft performance, Inventions, Pressure measurements, Shock waves.

For abstract, see STAR 1213

N74-21632/6GA PC$4.00/MF$1.45
Scientific Translation Service, Santa Barbara, Calif.
NUMERICAL INVESTIGATION OF VORTEX SHEETS ISSUING FROM A SEPARATION LINE NEAR THE LEADING EDGE.
C. Rehbach. Apr 74, 17p NASA-TT-F-15530, A74-18289
Contract NASW-2483
Tran-Transl. Into English from Rech. Aerosp. (France), Nov. - Dec. 1973 p 325-330.

Descriptors: *Aerodynamic characteristics, *Air flow, *Delta wings, *Slender wings, *Vortex sheets, Data acquisition, Numerical analysis, Pressdre distribution.

For abstract, see STAR 1213

N74-21633/4GA PC$10.00/MF$1.45
Kansas Univ. Center for Research, Inc., Lawrence. Flight Research Lab.
AN ANALYTICAL INVESTIGATION OF WING-JET INTERACTION.
E. C. Lan. Apr 14, 136p NASA-CR-138140, CRINC-FRL-74-001
Contract NGR-17-002-107

Descriptors: *Aerodynamic characteristics, *Flow distribution, *Inviscid flow, *Jet flow, *Wing planforms, Mathematical models, Numerical analysis, Slipstreams.

For abstract, see STAR 1213

N74-21634/2GA PC$3.75/MF$1.45
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
LOW SPEED AERODYNAMIC CHARACTERISTICS OF NACA 6716 AND NACA 4416 AIRFOILS WITH 35 PERCENT-CHORD SINGLE-SLOTTED FLAPS.
G. J. Bingham, and K. W. Noonan. May 74, 52p NASA-TM-X-2623, L-8410
Subm-Prepared in Cooperation with Army Air Mobility R and D Lab., Hampton, VA.

Descriptors: *Airfoils, *Lift, *Pitching moments, *Two dimensional flow, *Wind tunnel tests, Aerodynamic configurations, Aerodynamic forces, Lift devices, Wing slots.

For abstract, see STAR 1213

N74-21635/9GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
ON THE USE OF THICK-AIRFOIL THEORY TO DESIGN AIRFOIL FAMILIES IN WHICH THICKNESS AND LIFT ARE VARIED INDEPENDENTLY.
R. L. Barger. May 74, 15p NASA-TN-D-7579, L-9350

Descriptors: *Aerodynamic configurations, *Airfoils, *Lift, *Pressure distribution, Aerodynamic characteristics, Aerodynamic coefficients, Performance prediction.

For abstract, see STAR 1213

N74-21636/7GA PC$5.25/MF$1.45
Aeronautical Research Labs., Melbourne (Australia).
A PRELIMINARY TOWING TANK STUDY OF THE TRAILING VORTEX GENERATED BY A RECTANGULAR WING, INCLUDING THE EFFECTS OF SEVERAL TIP MODIFICATIONS.
D. H. Thompson. Sep 73, 42p ARL/A-NOTE-342

Descriptors: *Flow visualization, *Rectangular wings, *Test facilities, *Turbulent wakes, *Vortices, Aerodynamic configurations, Flow distribution, Wing planforms.

For abstract, see STAR 1213

N74-21637/5GA PC$4.75/MF$1.45
Technion - Israel Inst. of Tech., Haifa. Dept. of Aeronautical Engineering.
DETERMINATION OF THE ALLOWABLE TOLERANCES FOR THE ASYMMETRIES OF A FREE ROLLING VEHICLE.
A. Kirszenblat. Aug 73, 31p TAE-185

Descriptors: *Aerodynamic coefficients, *Aircraft performance, *Flight characteristics, *Rolling moments, Aerodynamic characteristics, Equations of motion, Numerical analysis.

For abstract, see STAR 1213

N74-21639/1GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
FLIGHT REYNOLDS NUMBER EFFECTS ON A CONTOURED BOATTAIL NOZZLE AT SUBSONIC SPEEDS.
R. Chamberlin. May 74, 24p NASA-TM-X-3053, E-7818

Descriptors: *Aerodynamic configurations, *Aerodynamic interference, *Boattails, *F-106 aircraft, *Gas generators, *Subsonic speed, Flight tests, Nozzle design, Nozzle flow, Propulsion system performance.

For abstract, see STAR 1213

N74-21646/6GA PC$4.00/MF$1.45
Scientific Translation Service, Santa Barbara, Calif.
A METHOD FOR AVOIDING INSECT ROUGHNESS ON AIRCRAFT.
F. X. Wortmann. Apr 74, 13p NASA-TT-F-15454
Contract NASW-2483
Tran-Transl. Into English from Luftahrttechnik, Raumfahrttechnik (West Germany), V. 9, No. 9, Sep. 1963 p 272-274.

Descriptors: *Aerodynamic drag, *Drag, *Elastic sheets, *Insects, *Leading edges, *Wing planforms, Aerodynamic configurations, Aircraft performance, Skin friction, Surface properties.

For abstract, see STAR 1213

N74-21647/4GA PC$8.00/MF$1.45
Kansas Univ. Center for Research, Inc., Lawrence. Flight Research Lab.

AN INVESTIGATION OF SEPARATE SURFACE STABILITY AUGMENTATION SYSTEMS FOR GENERAL AVIATION AIRCRAFT.
Progress Report.
Apr 74, 100p NASA-CR-138120, PR-9
Contract NGR-17-002-095

Descriptors: *Aircraft control, *Aircraft performance, *Flight control, *General aviation aircraft, Failure analysis, Flight safety, Performance prediction, Systems engineering.

For abstract, see STAR 1213

N74-21648/2GA PC$9.25/MF$1.45
Oklahoma State Univ., Stillwater. School of Electrical Engineering.
OPTIMAL CONTROLLER DESIGN FOR HIGH PERFORMANCE AIRCRAFT UNDERGOING LARGE DISTURBANCE ANGLES.
Final Report.
R. P. Rhoten. 28 Feb 74, 124p NASA-CR-138130
Contract NGR-37-002-096

Descriptors: *Aircraft control, *Aircraft performance, *F-8 aircraft, *Flight control, Aerodynamic coefficients, Data processing, Systems engineering.

For abstract, see STAR 1213

N74-21649/0GA PC$4.00/MF$1.45
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
FREE-FLIGHT INVESTIGATION OF THE STABILITY AND CONTROL CHARACTERISTICS OF A STOL MODEL WITH AN EXTERNALLY BLOWN JET FLAP.
L. P. Parlett, S. J. Emerling, and A. E. Phelps, Iii.
Apr 74, 84p NASA-TN-D-7411, L-9148

Descriptors: *Aircraft control, *Aircraft stability, *Externally blown flaps, *Short takeoff aircraft, *Transport aircraft, *Turbofan engines, Flight characteristics, Flight tests, Lift augmentation, Static aerodynamic characteristics.

For abstract, see STAR 1213

N74-21653/2GA PC$3.25/MF$1.45
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
EXTRACTION FROM FLIGHT DATA OF LONGITUDINAL AERODYNAMIC COEFFICIENTS FOR F-8 AIRCRAFT WITH SUPERCRITICAL WING.
J. L. Williams, and W. T. Suit. May 74, 26p NASA-TN-D-7470, L-9203

Descriptors: *F-8 aircraft, *Longitudinal stability, *Supercritical wings, *Wind tunnel tests, Aerodynamic characteristics, Aerodynamic coefficients, Data acquisition, Numerical analysis.

For abstract, see STAR 1213

N74-22414/8GA PC$3.25/MF$1.45
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
INTERFERENCE BETWEEN EXHAUST SYSTEM AND AFTERBODY OF TWIN-ENGINE FUSELAGE CONFIGURATIONS.
J. F. Runckel. May 74, 44p NASA-TN-D-7525, L-9283

Descriptors: *Aerodynamic interference, *Afterbodies, *Body-wing and tail configurations, *Exhaust systems, *Fuselages, Aerodynamic characteristics, Aerodynamic drag, Propulsion system configurations.

For abstract, see STAR 1213

1B. Aeronautics

AD-780 625/0GA PC$7.00/MF$1.45
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Engineering
INFLUENCE OF VARIABLE THRUST ON BASIC FIGHTER MANEUVERS.
Master's thesis,
Bruce G. Leonard, Jr. Mar 74, 76p Rept no. GAW/MC/74-15

Descriptors: *Jet fighters, *Flight maneuvers, Flight paths, Thrust control, Aerial warfare, Aerodynamics, Kill probabilities, Digital simulation, Theses.
Identifiers: F-4 aircraft, Variable thrust.

The report contains an optimization analysis on the effect of variable thrust on basic fighter maneuvers. Optimization techniques are used to find the best thrust control to enable a pursuer to prevent a target flight path overshoot when attempting to launch a heat seeking missile. The conjugate gradient method is used to maximize the probability of kill by changing the initial estimated aircraft controls to improve the missile launch conditions. The variable controls are thrust, lift coefficient and bank angle. A multiplier method is used to enforce boresight angle restrictions at launch. Open loop control histories are generated by the conjugate gradient technique through the use of a digital computer. The time of flight and the missile probability of kill resulting from the use of constant maximum thrust are compared to those resulting from the use of a variable thrust control. (Modified author abstract)

N74-21658/1GA PC$3.25/MF$1.45
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
SIMULATION OF DECELERATING LANDING APPROACHES ON AN EXTERNALLY BLOWN FLAP STOL TRANSPORT AIRPLANE.
W. D. Grantham, L. T. Nguyen, and P. L. Deal.
May 74, 50p NASA-TN-D-7463, L-9242

Descriptors: *Aircraft landing, *Aircraft performance, *Short takeoff aircraft, *Transport aircraft, Aerodynamic characteristics, Externally blown flaps, Flight simulation, Lift augmentation.

For abstract, see STAR 1213

N74-21661/5GA PC$15.75/MF$1.45
California Univ., Davis. Dept. of Mechanical Engineering.
STUDY OF DYNAMICS OF X-14B VTOL AIRCRAFT.
Final Report, Oct. 1970 - Sep. 1973.
W. V. Loscutoff, J. L. Mitchiner, R. A. Roesener, and J. A. Seevers. Nov 73, 253p NASA-CR-138185
Contract NGR-05-004-051

Descriptors: *Aircraft performance, *Flight control, *Hovering, *X-14 aircraft, Aircraft stability, Flight characteristics, Research projects.

For abstract, see STAR 1213

N74-21662/3GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
FORCE MODIFICATION AND DEFLECTION LOSS COMPENSATION TO THE PILOT'S CONTROLS IN AN AIRCRAFT SIMULATOR.
W. B. Cleveland. May 74, 18p NASA-TM-X-3058, A-5359

Descriptors: *Cockpit simulators, *Control simulation, *Flight simulation, *Pilot training, Equipment specifications, Performance tests, Systems analysis.

For abstract, see STAR 1213

N74-21663/1GA PC$9.75/MF$1.45
Technische Univ., Berlin (West Germany). Inst. fuer Luft- und Raumfahrt.
PROBLEMS OF PILOT-AUTOMATIC CONTROL INTERACTIONS IN FLIGHT CONTROL DAS PROBLEM DES ZUSAMMENWIRKENS VON FLUGZEUGFUEHRER UND REGLER IN DER FLUGFUEHRUNG.
D. Dey, and U. Kirchhoff. May 73, 134p ILR-4-1973
Language in German.

Descriptors: *Automatic flight control, *Blind landing, *Pilot performance, *Vertical landing, Aircraft landing, Controllers, Man machine systems.

For abstract, see STAR 1213

PB-233 204/7GA PC$10.00/MF$1.45
National Transportation Safety Board, Washington, D.C. Bureau of Aviation Safety.
AIRCRAFT ACCIDENT REPORTS. BRIEF FORMAT, U.S. CIVIL AVIATION. ISSUE NUMBER 4 OF 1973 ACCIDENTS. FILE NUMBERS: 3-2701 THRU 3-3312, 3-3314 THRU 3-3531, 3-3533 THRU 3-3600.
9 May 74, 521p NTSB-BA-74-2

Descriptors: *Aviation accidents, *Accident investigations, Collision research, Civil aviation, General aviation aircraft, Commercial aircraft, Passenger aircraft, Transport aircraft, Damage, Casualties.

The publication contains selected aircraft accident reports in brief format, occurring in U.S. Civil Aviation operations during calendar year 1973. The 898 General Aviation accidents represent a random selection. The publication is issued irregularly, normally six times each year. The brief format presents the facts, conditions, circumstances, and probable cause(s) for each accident. Additional statistical information is tabulated by type of accident, phase of operation, kind of flying, injury index, aircraft damage, conditions of light, pilot certificate, injuries, and causal factors.

PB-233 366/4GA PC$3.00/MF$1.45
National Transportation Safety Board, Washington, D.C. Bureau of Aviation Safety.
AIRCRAFT ACCIDENT REPORT. PIEDMONT AIRLINES, BOEING 737 (N751N), GREENSBORO, N.C. OCTOBER 28, 1973.
22 May 74, NTSB-AAR-74-7

Descriptors: *Aviation accidents, *Accident investigations, Collision research, Instrument landing, Skid resistance, Runways, Rain, Spoilers, Transport aircraft, Passenger aircraft, Jet aircraft.
Identifiers: Boeing 737 aircraft.

At 2221 e.s.t. on October 28, 1973, Piedmont Airlines Flight 20 (N751N), a B-737, ran off the end of runway 14 after landing at the Greensboro-High Point-Winston-Salem Regional Airport, in Greensboro, North Carolina. There were 92 passengers and 4 crewmembers aboard; 4 passengers and 1 flight attendant were injured slightly. Flight 20 made an ILS approach to runway 14 and touched down at a faster-than-normal airspeed 2,600 feet beyond the approach end of the runway. The landing was executed during heavy rain showers and with a following wind. The aircraft ran off the end of the runway, and the three landing gears collapsed as the aircraft crossed a service road, 640 feet beyond the runway. The aircraft was damaged substantially. The National Transportation Safety Board determines that the probable cause of this accident was ineffective braking action caused by dynamic hydroplaning on a rain-flooded runway.

PB-233 367/2GA PC$3.25/MF$1.45
National Transportation Safety Board, Washington, D.C. Bureau of Aviation Safety.

AIRCRAFT ACCIDENT REPORT. WORLD AIRWAYS, INC. DC-8-63F, N802WA, KING COVE, ALASKA, SEPTEMBER 8, 1973.
8 May 74, 32p NTSB-AAR-74-6

Descriptors: *Aviation accidents, *Accident investigations, Collision research, Approach, Descent, Crash landing, Military transportation, Transport aircraft, Jet aircraft, Passenger aircraft.
Identifiers: DC-8 aircraft.

About 0542 Alaska daylight time on September 8, 1973, World Airways, Inc., Flight 802, a DC-8-63F, crashed into Mt. Dutton, near King Cove, Alaska. The six occupants--three crewmembers and three nonrevenue company employees--were killed. The aircraft was destroyed by impact and fire. Flight 802 was a Military Airlift Command contract cargo flight from Travis AFB, California, to Clark AFB, Philippine Republic, with intermediate stops at Cold Bay, Alaska, and Yokota AFB, Japan. It was cleared for an approach 125 miles east of the Cold Bay Airport. The National Transportation Safety Board determines that the probable cause of the accident was the captain's deviation from approved instrument approach procedures.

1C. Aircraft

AD-780 581/5GA PC$8.25/MF$1.45
Texas Instruments Inc Dallas Equipment Group
A CONCEPTUAL DEFINITION STUDY FOR A DIGITAL AVIONICS INFORMATION SYSTEM (APPROACH II). VOLUME I.
Final rept. 1 Feb-30 Jun 73,
C. T. Brodnax. Mar 74, 395p* AFAL-TR-73-427-Vol-1
Contract F33615-73-C-1156
See also Volume 2, AD-780 582.

Descriptors: *Avionics, *Information systems, Digital systems, Data processing equipment, Display systems, Control.
Identifiers: DAIS(Digital Avionics Information Systems), Digital avionics information systems.

The report covers the digital avionics information system (DAIS) definition study which was intended to define the concepts for low cost avionics for the 1980s aircraft. A DAIS core was defined to consist of processor ensemble, controls/displays, information transfer system, and software. The application of this core to solve the avionics problems was addressed and the required characteristics of each core element defined. In addition to solving the avionics problem, it was found that the DAIS core had great potential for increasing systems maintenance capability while reducing AGE requirements. DAIS must be designed to meet these requirements, as opposed to adding onto an existing system, if the full capability is to be achieved. (Author)

AD-780 582/3GA PC$9.25/MF$1.45
Texas Instruments Inc Dallas Equipment Group
A CONCEPTUAL DEFINITION STUDY FOR A DIGITAL AVIONICS INFORMATION SYSTEM (APPROACH II). VOLUME II. APPENDIXES A THRU D.
Final rept. 1 Feb-30 Jun 73,
C. T. Brodnax. Mar 74, 456p AFAL-TR-73-427-Vol-2
Contract F33615-73-C-1156
See also Volume 1, AD-780 581 and Volume 3, AD-780 583.

Descriptors: *Avionics, *Information systems, Digital systems, Data processing equipment, Display systems, Control, Matrices(Mathematics), Interactions, Navigation computers.
Identifiers: DAIS(Digital Avionics Information Systems), Digital avionics information systems.

Contents:
Parameter transformation matrix;
Math flow;
Display/control partitioning and control panel data sheets;
Display/control interaction matrices.

AD-780 583/1GA PC$9.25/MF$1.45
Texas Instruments Inc Dallas Equipment Group
A CONCEPTUAL DEFINITION STUDY FOR A DIGITAL AVIONICS INFORMATION SYSTEM (APPROACH II). VOLUME III. APPENDIXES E AND F.
Final rept. 1 Feb-30 Jun 73,
C. T. Brodnax. Mar 74, 470p AFAL-TR-73-427-Vol-3
Contract F33615-73-C-1156
See also Volume 2, AD-780 582.

Descriptors: *Avionics, *Information systems, Digital systems, Data processing equipment, Display systems, Control, Data processing, Transfer, Computer programming.
Identifiers: DAIS(Digital Avionics Information Systems), Digital avionics information systems.

Contents:
Data transfer and interface requirements;
Signal summary listing. This document is not fully legible. When stock is exhausted, microfiche only will be made available.

AD-780 608/6GA PC$8.00/MF$1.45
Advisory Group for Aerospace Research and Development Paris (France)
PREDICTION METHODS FOR AIRCRAFT AERODYNAMIC CHARACTERISTICS.
Lecture series.
May 74, 351p* Rept no. AGARD-LS-67
NATO furnished.

Descriptors: *Military aircraft, *Aerodynamic characteristics, Attack aircraft, Jet fighters, Transport aircraft, Supersonic characteristics, Transonic characteristics, Aerodynamic forces, Lift, Drag, Optimization, Boundary layer flow, External stores, Stability, Jet plane noise.

The research study provides an up-to-date account of methods of prediction of aerodynamic characteristics for both combat and transport aircraft (excluding rotorcraft), over conditions ranging from low speeds (CTOL, RTOL, STOL) through subsonic/transonic to supersonic speeds (climb, cruise, maneuver, descent). Aircraft lift and drag estimation methods are analysed along with related aerodynamic optimization techniques, taking into account practical methods for wing/body aerodynamic design and boundary-layer flow treatments. The prediction and implications of special aerodynamic characteristics associated with engine installation and external store effects are examined, relevant stability/control needs are reviewed, and some aircraft noise restraints on aerodynamic design are noted.

AD-780 614/4GA PC$5.00/MF$1.45
Lockheed-California Co Burbank
LABORATORY METHOD FOR EVALUATING EFFECT OF RUNWAY GROOVING ON AIRCRAFT TIRES.
Final rept. Dec 72-Jan 74,
G. Wittlin. Mar 74, 159p Rept no. LR-26151 ASD-TR-74-12, FAA-RD-74-12
Contract F33657-73-C-0311

Descriptors: *Aircraft tires, *Wear resistance, *Runways, *Grooving, Computer programs, Simulation, Test methods, Test equipment, Test facilities, Landing gear, Pavements, Concrete, Acceleration.
Identifiers: *Runway grooving.

The development of a laboratory technique which simulates an airplane operational touchdown on an existing representative grooved runway landing area is described. The laboratory technique demonstrates that chevron cutting of a 49 inch x 17 inch size tire (KC135, B727) landing on a dry 1/4 inch x 1/4 inch x 1 inch grooved concrete pavement slab is obtained which is representative of tire damage currently being experienced during airplane landings on grooved runways. A computer program is developed and used to analyze the method of approach and test results. Government and industry furnished tires, and eight different pavement configurations were tested. High speed motion pictures indicate that cutting occurs at the initial point of contact wherein speed is at a maximum. The test data is analyzed with regard to potentially critical parameters including energy absorption, forward velocity, and number of grooves traversed. (Modified author abstract)

AD-780 619/3GA PC$3.00/MF$1.45
Air Force Cambridge Research Labs L G Hanscom Field Mass
EQUATIONS DERIVED FOR COMPUTER PROGRAMMING OF HELIUM INFLATIONS FOR LARGE PLASTIC BALLOONS.
Instrumentation papers,
Bernard D. Gildenberg. 22 Apr 74, 18p Rept nos. AFCRL-TR-74-0200, AFCRL-IP-218

Descriptors: *Balloons, *Inflating, *Computations, *Helium, Computer programming, Tables(Data).

Helium inflation computations for large plastic research balloons are normally accomplished by a tedious mathematical procedure involving the use of tables which indicate available lift per tube at specified gas trailer pressures and temperatures. The tables evolved from MIT empirical data, and now have been approximated to within 0.1 lb of lift by a set of equations specifically developed for use in computer programs. The history of the tables, the advantages of converting from manual to computer processing of inflation computations, and resultant accuracies are covered in the report. (Author)

AD-780 632/6GA PC$9.00/MF$1.45
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Engineering
THE EFFECT OF SHAPE OF AIRCRAFT VULNERABLE AREA AND PROBABILITY OF KILL FOR AN ANTIAIRCRAFT ARTILLERY SIMULATION MODEL.
Master's thesis,
James P. VerStreate. Mar 74, 119p Rept no. GAW/MC/74-19

Descriptors: *Attack bombers, *Reconnaissance aircraft, *Antiaircraft gunnery, *Aerodynamic configurations, Vulnerability, Jet bombers, Computerized simulation, Antiaircraft missiles, Kill probabilities, Mathematical models, Threat evaluation, Fragmentation ammunition, Blast, Theses.
Identifiers: A-10 aircraft, OV-10 aircraft, V-10 aircraft.

An investigation is made to determine the effect of object shape on the calculation of 26 view vulnerable areas from six orthogonal views by the geometric projection method. Errors in vulnerable area are found for a parallelepiped, a pyramid, a cone, a cylinder, a sphere, a combination of these bodies, and two aircraft shapes - the OV-10 and the A-10. The POO1 Antiaircraft Artillery Simulation Computer Program is used to determine probability of kill variation due to errors in vulnerable areas of the aircraft shapes. Errors in vulnerable area for the geometric bodies vary from 0% to 70% of actual area depending on the object and view. Vulnerable area variations average 6% of actual vulnerable area for the OV-10, 13% for the A-10 computer model, and 14% for the A-10 aircraft. (Modified author abstract)

AD-780 658/1GA PC$6.75/MF$1.45
Air Force Flight Dynamics Lab Wright-Patterson AFB Ohio
A LIBRARY OF COMPUTER PROGRAMS IN FLIGHT VEHICLE TECHNOLOGY--1973.
Technical rept.,
Ronald P. Meyers. Apr 74, 283p Rept no. AFFDL-TR-74-26
Supersedes AD-835 368 and AD-869 613.

Descriptors: *Aircraft, *Computer programs, Acoustics, Aerodynamics, Escape systems, Flight control systems, Airframes, Dynamics.
Identifiers: Computer aided design.

The report contains a compilation of computer programs useful in the design of flight vehicles. Technical areas covered are varied and numerous and include: structures, vehicle dynamics, crew escape, prototype development, aerodynamics, flight control, and landing gear subsystems. All programs were devised in-house in the Air Force Flight Dynamics Laboratory or were prepared as directed by them under R and D contracts. (Author)

AD-780 698/7GA PC$10.50/MF$1.45
Army Engineer Waterways Experiment Station Vicksburg Miss
HELICOPTER MOVEMENT ON UNIMPROVED TERRAIN.
Technical rept.,
Edgar S. Rush, and Charles E. Green. Jan 74, 148p Rept no. AEWES-TR-M-74-1

Descriptors: *Helicopters, *Offroad traffic, *Soil mechanics, Ground support equipment, Aircraft tires, Soils, Trafficability, West Germany.
Identifiers: *Soil tire interactions.

A brief review is presented of the current state of the art of criteria for determining the ground-flotation requirements for landing gear of aircraft, particularly fixed-wing aircraft, and criteria for estimating cross-country performance of military vehicles. Discussions are also presented of three soil strength parameters: California Bearing Ratio (CBR), airfield index (AI), and cone index (CI). Results of tests with three helicopter tires in prepared and natural soils are presented, and relations are shown among soil strength, towed motion resistance of some assumed helicopter configurations, and maximum-drawbar-pull capabilities of selected ground vehicles. Also presented is the distribution of terrain factors mapped in a selected West German transect and the probability of moving helicopters over the terrain. (Modified author abstract)

AD-780 720/9GA PC$6.50/MF$1.45
Boeing Vertol Co Philadelphia Pa
ROTOR BLADE TREATMENTS TO MINIMIZE ELECTROSTATICALLY GENERATED NOISE ON THE HLH HELICOPTER,
R. DeRosa, and J. Solak. 1 May 74, 67p Rept no. D301-10279-1
Contract DAAJ01-73-A-0017

Descriptors: *Helicopters, *Helicopter rotors, Antistatic techniques, Protective coatings, Electrostatic fields, Electric discharges, Electrical corona, Noise(Electrical and electromagnetic), Static dischargers, Electrostatic charge.
Identifiers: HLH(Heavy Lift Helicopters), Heavy lift helicopters.

A laboratory investigation was undertaken to evaluate the severtiy of precipitation-static noise to be expected on the Heavy Lift Helicopter (HLH) low-frequency systems, and to define the requirements of techniques for noise elimination on the HLH. This investigation, using a 1/25th scale model of the HLH and actual proposed rotor-blade panel samples revealed the need for RFI protection on the HLH. Recommendations were made to install P-static dischargers on the HLH rotor blades, and the optimum number and location of these dischargers was discussed. Noise reduction afforded by various rotor-blade-coating systems was also investigated and reported. A recommendation was made for a particular coating system, based on noise-reduction and surface-resistivity measurements. (Author)

AD-780 754/8GA PC$3.25/MF$1.45
Army Engineer Waterways Experiment Station Vicksburg Miss
HELICOPTER DOWNWASH DATA.
Grady W. Leese, and John T. Knight, Jr. Jun 74, 48p Rept no. AEWES-Misc Paper-S-74-17

Descriptors: *Helicopters, *Downwash, *Army aircraft, Flow fields, Velocity, Helicopter rotors, Measurement, Takeoff, Hovering, Flyby.
Identifiers: OH-58 aircraft, OH-6A aircraft, AH-1G aircraft, H-58 aircraft, H-6 aircraft, H-1 aircraft, UH-1H aircraft, UH-1M aircraft, CH-47 aircraft, CH-54 aircraft, H-47 aircraft, H-54 aircraft, Huey Cobra.

The report describes an investigation involving measurement of horizontal velocities, along and up to six feet above the ground surface, generated by the rotor systems of various Army helicopters during takeoff, hover, and fly-by operations. Measurements of ground-wash velocities during various operational modes were collected for OH-58A, OH-6A, AH-1G, UH-1H, UH-1M, CH-47, and CH-54 helicopters. (Modified author abstract)

AD-780 773/8GA PC$4.50/MF$1.45
Naval Air Development Center Warminster Pa Air Vehicle Technology Dept
PROPOSED QF-4B SUPPLEMENT TO THE F-4B NATOPS FLIGHT MANUAL (NAVAIR 01-245FDB-1).
Phase rept.,
William G. Seeman, Jr. 31 Dec 73, 124p Rept no. NADC-73219-30

Descriptors: *Jet fighters, *Remotely piloted vehicles, *Target drones, Flight control systems, Remote control, Telemeter systems, Airframes, Modification, Weapon systems.
Identifiers: *Aircraft modification, F-4 aircraft, F-4B aircraft, QF-4B drones.

The report presents a general description of, and operating procedures for, the QF-4B target aircraft. It is intended to supplement the existing F-4B NATOPS Flight Manual. Consequently, the report is written with the presumption that the reader is familiar with the F-4B NATOPS Flight Manual. (Author)

AD-780 774/6GA PC$3.25/MF$1.45
Naval Air Development Center Warminster Pa Air Vehicle Technology Dept
NAVAIRDEVCEN GRAPHITE-EPOXY COMPOSITE WING FOR BQM-34E: STATIC TEST RESULTS.
Final rept.,
Mark Libeskind, Joseph Minecci, S. L. Huang, and Edward J. McQuillen. 3 Dec 73, 29p Rept no. NADC-73244-30
See also report dated 12 Nov 73, AD-774 874.

Descriptors: *Wings, Composite materials, Epoxy resins, Graphite, Target drones, Static tests, Structural properties, Supersonic airfoils, Loads(Forces).
Identifiers: BQM-34 drones, BQM-34E drones.

A graphite-epoxy composite wing for the BQM-34E unmanned supersonic aerial target vehicle has been successfully static tested to 100% design limit load at the NAVAIRDEVCEN. (Author)

AD-780 797/7GA PC$4.50/MF$1.45
Logistics Management Inst Washington D C
ECONOMIC FEASIBILITY OF STANDARDIZED AVIONICS.
May 74, 105p Rept no. LMI-73-12
Contract SD-321

Descriptors: *Avionics, Economics, Standardization, Feasibility studies, Inertial navigation, Radio altimeters, Costs, Life cycles.

The study examines some of the economic implications of using standard avionics. It uses case studies of radar altimeters and inertial navigation systems to identify the major elements of life cycle cost that might be affected by standardization and to estimate the order of magnitude of possible savings. Also included are the major risks of standardization and a consideration of the value of form, fit, and function standards to the Military. (Author)

AD-780 822/3GA PC$4.75/MF$1.45
Kaman Aerospace Corp Bloomfield Conn
CABLE-OPERATED ZERO-IMPEDANCE DECOUPLER (COZID).
Final rept.,
Michael A. Bowes, and Ross F. Metzger. Apr 74, 147p USAAMRDL-TR-74-4
Contract DAAJ02-73-C-0027

Descriptors: *Helicopter hoists, *Slings, Vibration, Damping, Dynamic loads, Stress testing, Experimental design.
Identifiers: *Decouplers.

The ability of the helicopter to carry heavy, oversized cargo external to the airframe is a major contributor to the vehicle's operational flexibility. This capability permits the rapid transfer of an almost unlimited variety of materiel without the imposition of severe restrictions on materiel size, shape or weight distribution. One factor which imposes a potential limitation on this flexibility is the generation of high airframe/external load vibration levels caused by resonance or near resonance of the helicopter/sling/external cargo dynamic system with rotor induced forces. Alleviation of this condition, which is generally referred to as vertical bounce, is the ultimate objective of the Cable-Operated Zero-Impedance Decoupler (COZID) development effort described in the report.

AD-780 837/1GA PC$3.00/MF$1.45
Army Air Mobility Research and Development Lab Fort Eustis Va Eustis Directorate
INCENDIARY GUNFIRE EVALUATION OF A CONDENSATE-FORMED FUEL FOG INERTING SYSTEM,
Charles M. Pedriani. May 74, 13p Rept no. USAAMRDL-TN-15

Descriptors: *Army aircraft, *Fuel tanks, *Ballistic testing, Incendiary projectiles, Survival(General), Fuel sprays, Gunfire, Vulnerability.
Identifiers: *Ullage.

Army aircraft are vulnerable to catastrophic fuel tank explosions from incendiary impact in the ullage. Previous testing indicated that aircraft fuel tank inerting concepts that create overrich ullage atmospheres should have a high probability of success. Nevertheless, initial attempts to design such a system using fuel fog techniques met with failure. Subsequently, a unique condensate-formed fuel fog system was tested under Contract DAAJ02-73-C-0087 and found to be effective in preventing ullage explosions caused by an electric match. After completion of the contract, the system was tested further and found to be ineffective in preventing fires initiated by an incendiary gunfire simulator. (Modified author abstract)

AD-780 904/9GA PC$3.75/MF$1.45
Royal Aircraft Establishment Farnborough (England)
RANGE PERFORMANCE IN CRUISING FLIGHT.
Technical rept.,
D. H. Peckham. Mar 74, 58p Rept no. RAE-TR-73164 DRIC-BR-40126

Descriptors: *Aircraft, *Range(Distance), Flight paths, Flight maneuvers, Fuel consumption, Lift to drag ratio, Great Britain.

The classical theory of range performance is reviewed, and some further relationships derived. The first part of the paper deals with 'specific range', which is the instantaneous range performance of an aircraft at a point on a cruise

trajectory, in terms of distance covered per unit quantity of fuel consumed. The second part of the paper is concerned with the integration of specific range over a given flight trajectory, to give the 'integral range' on a given quantity of fuel; comparisons are made between the ranges obtained using various cruising techniques, and some numerical examples are included. (Author)

AD-780 905/6GA PC$5.00/MF$1.45
Hughes Aircraft Co Culver City Calif Display Systems and Human Factors Dept
HIGHLY RELIABLE VERTICAL DISPLAY SYSTEM.
Final rept. 10 Nov 72-10 Nov 73 on Phase 2,
H. L. Bjelland. May 74, 153p Rept nos. HAC-Ref-C6842, HAC-P73-482
Contract N62269-73-C-0333
See also report AD-752 510.

Descriptors: *Display systems, *Cathode ray tube screens, *Radar scanning, *Attack aircraft, All weather, Digital systems, Vertical orientation, Naval aviation, Reliability, Mechanization, Narrowband, Phosphors, Computer applications, Human factors engineering.
Identifiers: *Vertical display systems.

The purpose of the work is to investigate the critical mechanization parameters for a highly reliable Vertical Display System (VDS) with the overall goal of providing increased reliability. The three basic functional subunits are identified as the CRT indicator, the digital symbol generator, and the digital scan converter (DSC). Of the three major subunits comprising the VDS, the symbol generator offers the greatest potential for a very substantial gain in reliability.

AD-780 973/4GA PC$3.00/MF$1.45
Pennsylvania State Univ University Park Dept of Aerospace Engineering
AERODYNAMIC AND DYNAMIC PROBLEMS RELATING TO HEAVY-LIFT HELICOPTERS.
Final rept. 1 Sep 70-23 Feb 74,
Barnes W. McCormick. 6 May 74, 20p Rept no. PSU-Aersp-74-3 AROD-9334.4-E
Grants DA-ARO-D-31-124-73-G13, DA-ARO-D-31-124-73-G36

Descriptors: *Helicopters, *Helicopter rotors, Wake, Aerodynamics, Aspect ratio, Dynamic response, Vortices.
Identifiers: Heavy lift helicopters.

The report is descriptive in nature. For specifics of the technical accomplishment achieved under these grants, the reader is referred to the four theses by Potter, Rudy, Egolf and Pepin listed in the references. The first three of these theses have been completed and were prepared in partial fulfillment of the requirements for the Master of Science degree. Pepin's thesis is a Ph.D. dissertation which could not be completed before the expiration of the grant. It is currently being written and should be available shortly. All of these studies are generally related to helicopter applications although the specific motivation for their undertaking was initially the heavy-lift helicopter. The remainder of this report summarizes the findings of these investigators. (Modified author abstract)

AD-781 079/9GA PC$4.00/MF$1.45
Adaptronics Inc Mclean Va
COMPUTER SIMULATION OF RPV FLIGHT CHARACTERISTICS.
Final technical rept. 1 Jan-29 Sep 73,
Dixon Cleveland, Roger L. Barron, and Milford R. Derrick. Mar 74, 86p Rept no. 676-FTR AMRL-TR-73-119
Contract F33615-73-C-4055

Descriptors: *Remotely piloted vehicles, *Flight simulators, Digital simulation, Computer programs, Flight control systems, Flight instruments, Aeronautics, Flight training, FORTRAN.
Identifiers: PDP-12 computers, FORTRAN 4 programming language.

The report presents a set of equations of motion for remotely piloted vehicles. The equations are written in a form suitable for a real-time digital computer simulation. The simulation is intended to provide a test bed for evaluating alternative RPV control systems. A FORTRAN program for use on a Digital Equipment Corporation PDP-12 Computer is presented. Airframe parameter values are given for several flight conditions of an air-to-ground RPV, an air-to-air RPV and, a reconnaissance/EW RPV. (Author)

AD-781 080/7GA PC$5.75/MF$1.45
Adaptronics Inc Mclean Va
RPV/SELF-ORGANIZING CONTROL DEMONSTRATION SYSTEM. VOLUME II. HARDWARE DESCRIPTION, SYSTEM OPERATION AND MAINTENANCE, AND RPV SIMULATION.
Final technical rept. 1 Mar 72-31 Aug 73,
Dixon Cleveland, James R. Binkley, and Roger L. Barron. Feb 74, 209p Rept no. 663 FTR AMRL-TR-73-67
Contract F33615-72-C-1816
See also Volume 1, AD-773 860.

Descriptors: *Remotely piloted vehicles, *Self organizing systems, *Adaptive control systems, Control theory, Digital simulation, Logic elements, Man machine systems, Computer programs.
Identifiers: PDP-12 computers.

Self-organizing control is a form of adaptive control in which the controller uses an incremental model of the plant and identifies parameters in this model by means of calculations based upon recent-term plant excitation and response histories. This report (in two volumes) presents the theoretical derivation of refinements in self-organizing control techniques yielding substantial reduction of sampling rates of self-organizing controllers and identification of magnitudes as well as polarities of plant gain parameters. Additionally, this report describes the implementation of self-organizing controller logic in the form of breadboard digital hardware, the equations and programs for a PDP-12 computer real-time simulation of remotely piloted vehicle flight with 6 degrees of freedom (without limitation to small aerodynamic angles), and design of a demonstration system. (Modified author abstract)

AD-781 132/6GA PC$4.75/MF$1.45
General Research Corp Santa Barbara Calif Science and Technology Div
COST ANALYSIS OF AVIONICS EQUIPMENT.
Final rept. 16 Apr 73-1 Mar 74,
E. N. Dodson, S. F. Kornish, R. R. Liebermann, and W. E. Waller. Feb 74, 133p Rept no. GRC-CR-1-419-Vol-1 AFAL-TR-73-441-Vol-1
Contract F33615-73-C-1205

Descriptors: *Avionics, *Cost analysis, Fire control radar, Doppler navigation, Doppler radar, Inertial navigation, Digital computers, Logistics support.
Identifiers: Cost estimating relationships.

The report addresses the problem of predicting the development, production, and logistic support cost of avionics equipment well before a detailed description of its physical makeup is known. The approach was to derive parametric cost estimating relationships (CERs) for four types of avionics subsystems: fire control radars, inertial navigators, digital computers, and doppler navigation radars. These CERs are based on technical design variables familiar to the exploratory or advanced development design engineer. The development CERs incorporate an explicit measure of the development program's state-of-the-art advance. The logistic support CERs are functions primarily of equipment first unit cost or cumulative average cost. (Author)

AD-781 141/7GA PC$3.75/MF$1.45
Rand Corp Santa Monica Calif
EXAMPLES OF AIRCRAFT SCHEDULED-MAINTENACE ANALYSIS PROBLEMS,
Marsha Dade. Dec 73, 59p Rept no. R-1299-PR
Contract F44620-73-C-0011

Descriptors: *Aircraft, *Maintenance, Depots, Errors, Inspection, Reliability, Scheduling, Sampling, Data acquisition, Jet fighters, Jet transport planes.
Identifiers: IRAN(Inspect Repair As Necessary), Inspect repair as necessary, F-4 aircraft, F-4C aircraft, F-4D aircraft, F-100 aircraft, F-106 aircraft, J-57 engines, C-141 aircraft, C-141A aircraft, Scheduled maintenance.

A description is given of several statistical analyses of aircraft scheduled maintenance data illustrating the kinds of errors that might occur through the use of packaged computer programs and procedures by non-specialists. The analyses are grouped to illustrate three potential sources of analytical error: alternative causes for observed phenomena, variations in sample size, and failure to compensate for extraneous effects. (Modified author abstract)

AD-909 656/1GA PC$13.75/MF$1.45
Douglas Aircraft Co., Long Beach, Calif.
ADVANCED CONCEPT EJECTION SEAT (ACES) DEVELOPMENT AND QUALIFICATION.
Final rept. Sep 68-Apr 72,
Hammond R. Moy. Jan 73, 214p ASD-TR-73-2
Contract F33657-69-C-0223
Distribution Limitation now Removed.

Descriptors: *Ejection seats, Performance(Engineering), Design, Assembly, Release mechanisms, Catapults, Rocket engines, Pitch(Motion), Gyro stabilizers, Explosives initiators, Drogue parachutes, Deployment, Parachute descents, Towed bodies, Recovery, Survival kits, Aviation safety, Weight, Center of Gravity, Detectors, Pitot tubes, Reliability, Maintainability, Drop tests, Anatomical models, Damage assessment.
Identifiers: ACES(Advanced Concept Ejection Seat), *Advanced concept ejection seat, M-39 rocket motors.

The development of the Advanced Concept Ejection Seat (ACES) was proposed as a solution to critical operational problems experienced with current U.S. Air Force escape systems and as a major improvement in escape capability, especially under low-level, adverse attitude situations where relatively high crew fatality rates were encountered. A program encompassing design, as well as development and qualification testing, resulted in the successful demonstration of the ACES system at speeds up to 690 keas and at altitudes up to 41,000 feet (MSL). The major performance improvement was achieved by incorporation of a multi-mode recovery sequencing system, mortar-deployed recovery subsystem with variable effective reefing, and a gyro-controlled vernier rocket to pitch-stabilize the seat during the initial part of its trajectory. Onboard speed/altitude sensors and an automatic programmer, containing logic and electronic time delays, were used to establish the seat environment, select the recovery mode, and initiate ejection and recovery events.

N74-21650/8GA PC$9.50/MF$1.45
Kanner (Leo) Associates, Redwood City, Calif.
NEAR FIELD AND FAR FIELD SOUND RADIATION FROM DO 31 V/STOL JET TRANSPORT AND POSSIBILITIES FOR NOISE ABATEMENT IN FUTURE V/STOL DEVELOPMENT.
P. Bartels. Apr 74, 126p NASA-TT-F-15534, BMVG-FBWT-72-23
Contract NASW-2481
Tran-Transl. Into English of "Schallabstrahlung im Nah- und Fernfeld des V/STOL Strahltransporters Do 31 und Laermminderumgsmoeglichkeiten

bei Zukuenftigen Vstol-Entwicklungen'', Dornier-Werke G.M.B.H., Friedrichshafen, West Germany, Bmvg-Fbwt-72-23, 1972 167 p.

Descriptors: *Far fields, *Noise reduction, *Sound propagation, *V/stol aircraft, Aircraft design, Flight optimization.

For abstract, see STAR 1213

N74-21651/6GA PC$7.25/MF$1.45
Scientific Translation Service, Santa Barbara, Calif.
VSTOL AIRCRAFT STABILITY AND CONTROL EXPERIENCE FROM METHODS AND RESULTS OF DO 31 FLIGHT TESTS.
H. Wuennenberg. Apr 74, 84p NASA-TT-F-15531, BMVG-FBWT-72-25
Contract NASW-2483
Tran-Transl. Into English of ''Stabilitaet und Steuerbarkwit von Vstol-Flugzuegen Nach Verfahren und Ergebnissen Aus der Do 31-Fluger-probung'', Dornier-Werke G.M.B.H., Friedrichshafen, West Germany, Bmvg-Fbwt-72-25, 1972 90 p.

Descriptors: *Control stability, *Flight stability tests, *Hovering, *V/stol aircraft, Automatic landing control, Controllability, Do-31 aircraft, Flight mechanics.

For abstract, see STAR 1213

N74-21654/0GA PC$5.75/MF$1.45
National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
SENSITIVITY OF TRANSPORT AIRCRAFT PERFORMANCE AND ECONOMICS TO ADVANCED TECHNOLOGY AND CRUISE MACH NUMBER.
M. D. Ardema. Feb 74, 55p NASA-TM-X-62336

Descriptors: *Aircraft design, *Aircraft performance, *Economic factors, *Transport aircraft, Aerodynamic characteristics, Aerodynamic configurations, Payloads, Systems analysis.

For abstract, see STAR 1213

N74-21655/7GA PC$6.75/MF$1.45
Boeing Commercial Airplane Co., Seattle, Wash.
REDUNDANT ACTUATOR DEVELOPMENT STUDY.
Final Report.
D. R. Ryder. Dec 73, 73p NASA-CR-114730, D6-41511
Contract NAS2-7653

Descriptors: *Actuators, *Aircraft control, *Computerized simulation, *Flight control, *Supersonic transports, Aircraft stability, Mathematical models, Numerical analysis, Systems analysis.

For abstract, see STAR 1213

N74-21659/9GA PC$10.25/MF$1.45
Developmental Sciences, Inc., City of Industry, Calif. Aerospace Technology Div.
OBLIQUE WING REMOTELY PILOTED RESEARCH AIRCRAFT. VOLUME I: DEVELOPMENT.
Final Report.
Apr 74, 144p NASA-CR-114723
Contract NAS2-7211
Misc-Original Contains Color Illustrations.

Descriptors: *Aerodynamic configurations, *Aircraft design, *Remotely piloted vehicles, *Wing planforms, Aircraft stability, Airframes, Flight characteristics, Performance prediction.

For abstract, see STAR 1213

N74-21660/7GA PC$13.25/MF$1.45
Battelle Columbus Labs., Ohio.
EFFECTIVENESS EVALUATION OF STOL TRANSPORT OPERATIONS (PHASE 2).
Final Report.
D. W. Welp, R. A. Brown, D. G. Ullman, and M. B. Kuhner. 8 Feb 74, 204p NASA-CR-137481
Contract NAS2-6889

Descriptors: *Airline operations, *Computerized simulation, *Cost analysis, *Short haul aircraft, Economic factors, Ground support equipment, Terminal facilities.

For abstract, see STAR 1213

PAT-APPL-405 721 PC$4.00/MF$1.45
Department of the Air Force Washington D C
RETRIEVAL ASSEMBLY.
Patent Application,
Douglas B. Day. Filed 11 Oct 73, 16p Rept no.
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Helicopters, *Aerial pickup systems, Patents, Drones, Mechanical cables.
Identifiers: PAT-CL-244-137, *Patent applications.

The patent application relates to a retrieval assembly, in combination with an airborne vehicle capable of hovering (e.g., a helicopter), for use in retrieving a downed drone airborne vehicle. The assembly includes a hook subassembly, a pole subassembly which includes a multi-purpose pole, a recovery cable subassembly, and a swivel subassembly, all of which cooperate to capture, lift, support, and carry the downed drone vehicle. The drone, thereby, can be safely suspended beneath the helicopter, and also can rotate while dangling without twisting and subsequently breaking the recovery cable from which the drone is dangling. Therefore, the drone can be reliably, safely, quickly, and easily retrieved.

SLA-73-997 PC$6.00/MF$1.45
Sandia Labs., Albuquerque, N.Mex. (Usa).
PACKING AND INSTALLATION INSTRUCTIONS FOR SANDIA LABORATORIES/NASA/DFVLR ROCKET PAYLOAD PARACHUTE RECOVERY SYSTEM (P/N T19328-000).
H. E. Widdows. Apr 74, 60p
Contract AT(29-1)-789

Descriptors: Measuring instruments, Packaging, Parachutes, Rockets.

For abstract, see NSA 30 01, number 02406.

1D. Aircraft Flight Control and Instrumentation

N74-22101/1GA PC$4.00/MF$1.45
Defence and Civil Inst. of Environmental Medicine, Downsview (Ontario). Behavioural Sciences Div.
EVALUATION OF THE AAU-19 ALTIMETER DISPLAY AS MODIFIED FOR THE CANADIAN FORCES.
L. G. Innes. Aug 73, 14p DCIEM-73-R-948

Descriptors: *Altimeters, *Display devices, *Equipment specifications, Canada, Dials, Numbers, Windows (Apertures).

For abstract, see STAR 1213

1E. Air Facilities

AD-780 589/8GA PC$3.25/MF$1.45
New Mexico Univ Albuquerque Eric H Wang Civil Engineering Research Facility
SKID-RESISTANCE EVALUATION OF SEVEN ANTIHYDROPLANING SURFACES.
Final rept. 1 Nov 73-1 Feb 74,
Phil V. Compton, and Emil R. Hargett. May 74, 47p AFWL-TR-74-64
Contract F29601-74-C-0030

Descriptors: *Pavements, *Runways, *Skidding, Military facilities, Landing fields, Performance(Engineering), Surfaces, Test methods, Seals, Bituminous coatings, Friction, Test equipment, New Mexico.
Identifiers: Kirtland Air Force Base, *Hydroplaning.

Skid-resistance evaluations of seven antihydroplaning test strips were conducted between 15 to 20 November 1973. The test surfaces included a slurry seal, a grooved slurry seal, three test sections of Palmer Pavetread with various groove patterns and two porous friction surfaces, one with an emulsified asphalt and the other with 120-150 PEN asphalt and 5% rubber additive. Results indicate all surfaces provide a significant reduction in hydroplaning potential. A further test program is to be conducted to evaluate the performance of these surfaces under traffic and environmental conditions. (Author)

2. AGRICULTURE

2B. Agricultural Economics

PB-233 160/1GA PC$4.00/MF$1.45
Commonwealth Scientific and Industrial Research Organization, Glen Osmond (Australia). Div. of Soils.
THE COMPUTATION OF OPTIMAL RATES OF APPLICATION OF FERTILIZERS FROM QUADRATIC RESPONSE FUNCTIONS,
J. D. Colwell. 1974, 20p Technical Paper-21, ISBN-0-643-00101-8

Descriptors: *Fertilizers, *Agricultural economics, Mathematical models, Regression analysis, Computer programs, Profits, Cost estimates, Investments, FORTRAN, Australia.
Identifiers: Fertilizer application rates.

Calculations of optimal rates of application of fertilizers from yield response functions can be invalidated by two types of extrapolation error or by the functions not being of a diminishing form. These calculation hazards may be difficult to detect especially when functions are complex, representing the effects of two or more fertilizers on yield. Computer programs are described that carry out the calculations with checks for these hazards. The programs provided a basis for assessing the economic importance of fertilizers, even when calculation of optimal rates is not possible. The computer program is in Standard Fortran (American National Standards Institute) to allow ready adaptation to the requirements of most computers.

2C. Agricultural Engineering

AICS-4 PC$17.00/MF$1.45
Atomic Energy Commission, Bombay (India). Agro-Industrial Complex Working Group.
WATER UTILIZATION AND AGRICULTURAL DEVELOPMENT IN WESTERN UTTAR PRADESH (A STUDY OF PROBLEMS INVOLVED IN TUBEWELL IRRIGATION FOR HIGH CROPPING INTENSITY).
V. K. Gupta, P. S. George, and V. R. Gaikwad. 1971, 277p

Descriptors: (*India, *Agriculture), Economics, Efficiency, Fertilizers, Ground water, Iron, Irrigation, Management, Market, Nuclear power, Nutrients, Plants, Production, Surface waters.

For abstract, see NSA 30 01, number 02290.

JPRS-62195 PC$4.00/MF$1.45
Joint Publications Research Service, Arlington, Va.

DESIGNS OF AGRICULTURAL BUILDINGS AND STRUCTURES,
D. N. Topchii. 7 Jun 74, 79p
Trans. of mono. Selskokhozyaistvennye Zdaniya i Sooruzheniya, Moscow, 1973, p239-294.

Descriptors: *Agricultural engineering, *Farm buildings, Farm storage, Structural design, Crop driers, Reinforced concrete, Silos, Grain elements, Precast concrete, Handbooks, Translations, USSR.
Identifiers: Granaries.

The report contains selections from a book on the design of granaries and grain dryers.

N74-22046/8GA PC$5.50/MF$1.45
Environmental Research Inst. of Michigan, Ann Arbor. Infrared and Optics Div.
OPTICAL MODELING OF AGRICULTURAL FIELDS AND ROUGH-TEXTURED ROCK AND MINERAL SURFACES.
G. H. Suits, R. K. Vincent, H. M. Horwitz, and J. D. Erickson. Nov 73, 46p NASA-CR-134243, ERIM-31650-78-T
Contract NAS9-9784

Descriptors: *Farm crops, *Mathematical models, *Minerals, *Reflectance, *Rocks, *Surface properties, Forests, Infrared imagery, Mie scattering, Radiative transfer, Remote sensors.

For abstract, see STAR 1213

2D. Agronomy and Horticulture

AD-781 056/7GA Not available NTIS
National Research Council of Canada Saskatoon (Saskatchewan) Prairie Regional Lab
REGENERATION OF CASSAVA PLANTS FROM APICAL MERISTEMS,
K. K. Kartha, O. L. Gamborg, F. Constabel, and J. P. Shyluk. 4 Sep 73, 8p NRC-13475
Availability: Pub. in Plant Science Letters, v2 p107-113 1974.

Descriptors: *Plants(Botany), Regeneration(Physiology), Virus diseases, Elimination, Growth(Physiology), Canada.
Identifiers: Cassava, Manihot utilissima.

Apical meristem culture offers a rapid, efficient method for vegetative propagation of plants and for eliminating systemic viral infections. Since the first demonstration that virus-free dahlia plants could be regenerated from virus-infected plants by culturing apical meristems, this technique has been utilised to eliminate viruses from a wide range of plant species. Cassave (Manihot utilissima Pohl.) belonging to the family Euphorbiaceae is propagated vegetatively from stem cuttings. The crop is grown in Latin America, Africa, India, Java and Madagascar where the storage roots are used widely for human consumption. Propagation through stem cuttings encourages the spread of many virus diseases, such as cassava mosaic virus. This paper reports on procedures for regenerating cassava plants from the apical meristems.

N74-22050/0GA PC$4.00/MF$1.45
Environmental Research Inst. of Michigan, Ann Arbor.
WHEAT CLASSIFICATION EXERCISE, USING 11 JUNE 1973, ERTS MSS DATA FOR FAYETTE COUNTY, ILLINOIS (FOR CITARS TASK).
W. A. Malila, R. H. Hieber, D. P. Rice, and J. E. Sarno. 26 Sep 73, 20p NASA-CR-134253, TM-190100-21-R
Contract NAS9-9784

Descriptors: *Classifications, *Illinois, *Wheat, Crop identification, Data processing, Digital systems, Earth resources technology satellite 1, Multispectral band scanners, Remote sensors.

For abstract, see STAR 1213

N74-22053/4GA PC$4.00/MF$1.45
Lockheed Electronics Co., Houston, Tex. Aerospace Systems Div.
QUALITY OF SIGNATURES.
Final Report.
E. P. F. Kan. Apr 74, 18p NASA-CR-134263, LEC-3175
Contract NAS9-12200

Descriptors: *Spectral signatures, *Texas, *Wheat, Agriculture, Crops, Winter.

For abstract, see STAR 1213

PB-232 851/6GA PC$3.75/MF$1.45
Washington State Dept. of Highways, Olympia. Architectural Div.
VEGETATIVE COVER FOR HIGHWAY RIGHTS-OF-WAY.
Research program rept. Apr 70-Jul 73,
Russell N. Rosenthal. Oct 73, 56p RPR-14.1

Descriptors: *Vegetation, *Highways, *Rights of way, Plant growth, Survival, Grasses, Soil texture, Soil erosion, Slopes, Exposure, Temperature, Soil water, Landscaping.

A four year study of landscape plant establishment as affected by a number of environmental conditions was initiated in April, 1970. The relationship between plant survival and soil texture, soil temperature and exposure were evaluated. The affect of exposure on percent ground coverage of various grass species used in erosion control was also evaluated.

2E. Animal Husbandry

PATENT-3 642 574 Not available NTIS
Department of Agriculture, Washington, D.C.
METHOD FOR PRODUCING VACCINE FOR IMMUNIZATION OF POULTRY AGAINST MAREK'S DISEASE.
Patent, *Filed 29 Apr 70, patented 15 Feb 72, William Okazzaki, H. Graham Purchase, and Richard L. Witter. 15 Feb 72, 5p PAT-APPL-33 060,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Vaccines, *Viral diseases, *Animal diseases, *Poultry, *Patents, Immunity, Infectious diseases, Veterinary medicine, Herpetic viruses.
Identifiers: *Mareks disease, PAT-CL-195-1-5.

The invention is a vaccine produced from a turkey herpesvirus which is nonpathogenic in chickens but immunizes against Marek's disease.

PB-232 674/2GA MF$1.45
National Research Council, Washington, D.C. Committee on Animal Nutrition.
NUTRIENT REQUIREMENTS OF DOMESTIC ANIMALS. NUMBER 11: NUTRIENT REQUIREMENTS OF TROUT, SALMON, AND CATFISH.
Dec 73, 63p ISBN-0-309-02141-3
Paper copy available from National Academy of Sciences, 2101 Constitution Ave., Washington, D.C. 20418. $3.25.

Descriptors: *Animal nutrition, *Fishes, Chemical composition, Food processing, Food storage, Trout, Salmon, Catfishes, Diets, Feeding stuffs, Carbohydrates, Vitamins, Minerals, Metabolism, Proteins, Amino acids, Lipids.

The report summarizes the known nutrient requirements of these species and discusses special considerations for diet formulation and storage. Tables of feed composition presented provide values for good diet efficiency for fish intensively reared in fish culture, listed without inclusion; of a margin of safety for fish reared at standard environmental temperature. Topics include energy and metabolism in fish, protein and amino acid requirements, lipid requirements, carbohydrates, vitamins, minerals, symptoms of nutritional deficiency, and composition of feeds.

PB-232 827/6GA MF$1.45
National Research Council, Washington, D.C. Committee on Animal Nutrition.
EFFECT OF PROCESSING ON THE NUTRITIONAL VALUE OF FEEDS.
1973, 503p*
Presented at the Symposium on the Effect of Processing on the Nutritional Value of Feeds, Gainesville, Fla., 11-13, Jan 72. International Standard Book no. 0-309-02116-2.
Paper copy available from National Academy of Sciences, Printing and Publishing Office, 2101 Constitution Ave., Washington, D.C. 20418, PC$10.50.

Descriptors: *Meetings, *Animal nutrition, *Nutritive value, *Feeding stuffs, Diets, Food composition, Livestock, Poultry, Latin America, Canada, United States, Food processing, Chemical analysis.

Brought together in this report is much of the available information on the effects on nutritive value of feeds by processing. It is intended for all those engaged in manufacturing, processing, and formulating feeds, as well as for producers of livestock and poultry. The report is comprised of 36 individually authored papers by nutritionists from the United States, Latin American and Canada. Specific areas of discussion include chemical and nutritive values; processing to destroy natural toxins, molds, and salmonella; effects of processing on calcium, phosphorus, trace minerals, vitamins; animal and vegetable fats, and tannins; effects of processing on milk by-products, fish meal, meat meal, molasses, dried citrus pulp, alfalfa, corn, and soybeans; problems associated with feeds for beef cattle, dairy cattle, swine, horses, and mink; and a special series of papers related to Latin American problems.

3. ASTRONOMY AND ASTROPHYSICS

3B. Astrophysics

AD-780 863/7GA Reprint
Air Force Cambridge Research Labs L G Hanscom Field Mass
THEORETICAL CHROMOSPHERIC FLARE SPECTRA. I. HYDROGEN EQUILIBRIUM FOR THE KINEMATIC FLARE-SHOCK MODEL OF NAKAGAWA ET AL. (1973),
Richard C. Canfield, and R. Grant Athay. 19 Sep 73, 16p Rept no. AFCRL-TR-74-0236
Availability: Pub. in Solar Physics, v34 p193-206 1974.

Descriptors: *Chromosphere, *Solar flares, *Solar spectrum, Line spectra, Hydrogen, Atmosphere models.

The authors simultaneously solve the equations of radiative transfer and statistical equilibrium for a model hydrogen atom including Lyman-alpha, Lyman-beta, Balmer-alpha and the Lyman, Balmer and Paschen continua. The model atmospheres used are the results of Nakagawa et al. (1973) for a kinematic model of the chromospheric solar flare. It is found that the models adequately predict the total intensity of B alpha, its wing broadening, the presence of a red-shifted wing, the maximum electron density, the total line-of-sight second-level population and the narrowness in height of the B alpha emitting region. (Modified author abstract)

AD-780 879/3GA Reprint
Air Force Cambridge Research Labs L G Hanscom Field Mass

THE FORMATION OF MG (I) 4571 A IN THE SOLAR ATMOSPHERE. IV, EMPIRICAL VS SYNTHETIC ANALYSES,
Richard C. Altrock. 29 Oct 73, 22p Rept no. AFCRL-TR-74-0235
See also AD-772 314. Revision of report dated 24 Aug 73.
Availability: Pub. in Solar Physics, v34 p37-56 1974.

Descriptors: *Solar atmosphere, *Magnesium, *Solar spectrum, Atmosphere models, Line spectra, Intensity, Least squares method, Algorithms.

A comparison is made of synthetic and empirical analyses for the 4571 A line of Mg I. First, several different inversion techniques are applied to synthetic line profiles. The results show that at least some of these techniques are able to correctly reproduce the input atmosphere to a reasonable degree. Secondly, these same techniques are applied to equivalent observational data. In this case some of the techniques yield results that can be shown to be of comparable quality to the synthetic analysis. It is concluded that although the synthetic method is the best method to use in analyzing observations, some of the simpler empirical methods produce acceptable results in specified restricted cases. (Author)

AD-780 887/6GA Reprint
Air Force Cambridge Research Labs L G Hanscom Field Mass
THE PROFILE AND POLARIZATION OF THE CORONAL L ALPHA LINE,
Jacques M. Beckers, and Eric Chipman. 14 Nov 73, 15p Rept no. AFCRL-TR-74-0234
Availability: Pub. in Solar Physics, v34 p151-161 1974.

Descriptors: *Solar corona, *Solar spectrum, *Hydrogen, Line spectra, Polarization, Solar wind.

The authors calculate the profile and polarization of the L alpha line in the solar corona. Coronal temperature variation, solar wind and other non-thermal motions have been taken into account. Because of the relatively low atomic weight of hydrogen the profile of the L alpha line is a sensitive indicator of the coronal temperature. The line polarization contains relatively little information except for strong magnetic fields (>70G). (Author)

AD-780 922/1GA PC$3.00/MF$1.45
Owens Valley Radio Observatory Pasadena Calif
MODELS OF MASSIVE MOLECULAR CLOUDS,
B. Zuckerman, and N. J. Evans, II. 1974, 14p Rept no. 1974-7
Contract N00014-67-A-0094, Grant NSF-GP-30400
Prepared in cooperation with Maryland Univ., College Park Grant NSF-GP-26218.

Descriptors: *Interstellar matter, *Carbon monoxide, Molecules, Line spectra, Clouds.
Identifiers: Orion A region, Sagittarius B2 radio source.

Observations of carbon monoxide lines from massive molecular clouds, such as those near Orion A and Sgr B2, have recently been interpreted in terms of large scale motions, generally collapse or expansion, that imply rapid evolution of these clouds. The authors suggest an alternative explanation: the clouds are not dominated by large scale systematic motions and the CO profiles are determined primarily by local motions. Therefore, it is generally not possible to see through these clouds in optically thick lines of molecules such as CO and HCN. Some consequences and tests of this model are briefly discussed. (Author)

AD-780 923/9GA PC$3.00/MF$1.45
Owens Valley Radio Observatory Pasadena Calif
APERTURE SYNTHESIS OF FORMALDEHYDE ABSORPTION IN SGR B2,
D. H. Rogstad, I. A. Lockhart, and J. B. Whiteoak. 1974, 21p Rept no. 1974-8
Contract N00014-67-A-0094-0019

Descriptors: *Interstellar matter, *Formaldehyde, Radio sources(Astronomy), Extraterrestrial radio waves, Absorption.
Identifiers: Sagittarius B2 radio source.

Synthesis observations of the 4830 MHz formaldehyde absorption originating near Sgr B2 have been obtained with a resolution of 20 arcsec in right ascension and 40 arcsec in declination. The velocity resolution was 3.1 km/s. The results suggest that there are at least two absorbing clouds near the source. One cloud has a velocity of 80 km/s and is associated with only one of the two bright continuum components. Another cloud, with a velocity of 65 km/s, overlies the entire continuum distribution. At a velocity of 50 km/s, there is some evidence that a third cloud covers the southernmost region of the source. (Author)

AD-780 992/4GA Reprint
Air Force Cambridge Research Labs L G Hanscom Field Mass
THE LOCATION OF EXPLODING GRANULES. Research note,
Marc S. Allen, and Steven Musman. 28 Aug 73, 9p Rept no. AFCRL-TR-74-0227
Availability: Pub. in Solar Physics, v32 p311-314 1973.

Descriptors: *Chromosphere, *Solar activity, Solar disturbances, Explosions.
Identifiers: *Solar granulation, *Spicules.

The occurrence of narrow blue spikes in high resolution spectra of Fe I lambda 5269 taken at the Sacramento Peak Observatory by Hyder (1970) has led him to suggest that these features might be associated with the upward velocities in exploding granules and lead to formation of spicules. The purpose of this paper is to compare the location of exploding granules with the location of the chromospheric network. To accomplish this the locations of exploding granules were compared with the location of the overlying chromoaspheric network where concentrations of magnetic field and spicules appear.

COM-74-50190-356-1/GA MF$1.45
National Geophysical and Solar-Terrestrial Data Center, Boulder, Colo.
SOLAR-GEOPHYSICAL DATA NUMBER 356, APRIL 1974. PART I (PROMPT REPORTS). DATA FOR MARCH 1974, FEBRUARY 1974.
Apr 74, 112p SGD-356-Pt-1 NOAA-74052005
Paper copy available from National Climatic Center, Attn: Publications. Federal Bldg., Asheville, N.C. 28801. Subscription $30.50/year includes Part 1 (Prompt Reports) and Part 2 (Comprehensive Reports); $15.50/year for either part, including extra issue. $1.25/copy for either part; $0.75 for the extra issue.

Descriptors: *Solar activity, Statistical data, Tables(Data), Solar flares, Sunspots, Solar radio emission, Solar x rays, Solar cosmic rays, Geomagnetism, Ionospheric disturbances, Radio transmission.
Identifiers: Pioneer 6 spacecraft, Pioneer 9 spacecraft.

Prompt reports are given on data for March 1974 and February 1974. These deal with alert periods, daily solar indices, solar flares, solar radio waves and spacecraft observations. This issue also includes an index for 1973 and 1974.

COM-74-50190-356-2/GA MF$1.45
National Geophysical and Solar-Terrestrial Data Center, Boulder, Colo.
SOLAR-GEOPHYSICAL DATA NUMBER 356, APRIL 1974. PART II (COMPREHENSIVE REPORTS). DATA FOR OCTOBER 1973, SEPTEMBER 1973 AND MISCELLANEA.
Apr 74, 61p SGD-356-Pt-2 NOAA-74052006
Paper copy available from National Climatic Center, Attn: Publications Federal Bldg., Asheville, N.C. 28801. Subscription $30.50/year includes Part 1 (Prompt Reports) and Part 2 (Comprehensive Reports); $15.50/year for either part, including extra issue. $1.25/copy for either part; $0.75 for the extra issue.

Descriptors: *Solar activity, Statistical data, Tables(Data), Solar flares, Magnetic storms, Solar radio emission, Solar x rays, Solar cosmic rays.
Identifiers: Solar protons, Explorer 37 satellite.

The issue provides comprehensive data for October 1973 and September 1973 on solar flares, solar radio waves, solar X-ray radiation, solar proton monitoring, and magnetograms of geomagnetic storm.

JPRS-62167 PC$3.00/MF$1.45
Joint Publications Research Service, Arlington, Va.
COSMIC RADIATION BURST OBSERVED BY THE 'KOSMOS-461' ARTIFICIAL EARTH SATELLITE,
E. P. Mazets, S. V. Golenetskii, and V. N. Ilinskii. 5 Jun 74, 4p
Trans. of Zhurnal Eksperimentalnoi i Teoreticheskoi Fiziki. Pisma v Redsktsiyu (USSR) n2 p126-128, 20 Jan 74.

Descriptors: *Cosmic rays, Gamma rays, Scientific satellites, Translations, USSR.
Identifiers: Cosmos 461 satellite.

The report contains the results of observations of a burst of cosmic gamma radiation on 17 January 1972 observed by the 'Kosmos-461.'

N74-21793/6GA PC$4.00/MF$1.45
Ceskoslovenska Akademie Ved, Ondrejov. Astronomical Inst.
SOLAR RADIO DATA, DECEMBER 1973.
Dec 73, 13p

Descriptors: *Noise storms, *Solar flux, *Solar radio emission, *Tables (Data), Czechoslovakia, Electromagnetic noise, Solar observatories, Solar radio bursts.

For abstract, see STAR 1213

N74-21794/4GA PC$4.00/MF$1.45
Ceskoslovenska Akademie Ved, Ondrejov. Astronomical Inst.
SOLAR RADIO DATA, FEBRUARY 1974.
Feb 74, 14p

Descriptors: *Solar flux, *Solar radio emission, *Tables (Data), Czechoslovakia, Electromagnetic noise, Solar observatories, Solar radio bursts.

For abstract, see STAR 1213

N74-21795/1GA PC$4.00/MF$1.45
Ceskoslovenska Akademie Ved, Ondrejov. Ondrejov Observatory.
SOLAR RADIO DATA, NOVEMBER 1973.
Nov 73, 16p

Descriptors: *Solar flares, *Solar flux, *Solar radio emission, *Tables (Data), Czechoslovakia, Electromagnetic noise, Solar observatories, Solar radio bursts.

For abstract, see STAR 1213

N74-21804/1GA PC$4.00/MF$1.45
Northwestern Univ., Evanston, Ill.
MICROWAVE CONDUCTIVITY OF SLIGHTLY IONIZED GASES AND ELECTROMAGNETIC SCINTILLATIONS.
Final Report, 1 Jan. 1969 - 31 May 1972.

D. Mintzer. May 72, 3p NASA-CR-139000
Contract NGR-14-007-071
Subm-Submitted for Publication.

Descriptors: *Electrical resistivity, *Ionized gases, *Microwaves, *Scintillation, Boltzmann distribution, Interplanetary medium, Radio stars, Shock waves.

For abstract, see STAR 1213

N74-21839/7GA PC$4.50/MF$1.45
TRW Systems Group, Redondo Beach, Calif. Analysis and Experiment Support Section.
LUNAR OBSERVATIONS VERIFIER EDITOR PROGRAMMER'S MANUAL, REVISION 1.
E. L. Barnett. 19 Apr 74, 29p NASA-CR-134258, TRW-11176-H415-RO-02
Contracts NAS9-8166, PROJ. SKYLAB

Descriptors: *Computer programs, *Data processing, *Satellite observation, *User manuals (Computer programs), Apollo flights, Fortran, Lunar exploration, Lunar programs, Skylab program, Tape recorders.

For abstract, see STAR 1213

N74-22319/9GA PC$4.00/MF$1.45
Techtran Corp., Silver Spring, Md.
A STUDY OF CORONAL CONDENSATIONS BY MEANS OF THEIR X-UV LINE SPECTRUM.
G. Chambe. Aug 73, 19p NASA-TT-F-14745
Contract NASW-2485
Tran-Transl. Into English from Atstron. Astrophys. (West Germany - U. S.), V. 12, 1971 9 p.

Descriptors: *Condensation, *Line spectra, *Solar corona, *Thermal emission, Electron transitions, Iron, Neon, Oxygen, Silicon, Solar spectra, Solar x-rays, Spectrum analysis, Ultraviolet absorption, Xenon.

For abstract, see STAR 1213

N74-22422/1GA PC$11.00/MF$1.45
Stanford Univ., Calif. Inst. For Plasma Research.
A STUDY OF THE MEAN SOLAR MAGNETIC FIELD.
P. H. Scherrer. Dec 73, 158p NASA-CR-138131, SU-IPR-554
Contracts NGR-05-020-559, N00014-67-A-0112-0068

Descriptors: *Interplanetary magnetic fields, *Solar magnetic field, Astronomical observatories, Solar radiation, Statistical analysis.

For abstract, see STAR 1213

N74-22426/2GA PC$4.00/MF$1.45
Texas Univ., Dallas.
SPECIFIC PROBLEMS IN COSMIC RAY RESEARCH SOLVABLE THROUGH USE OF PIONEERS 6-9 SPACECRAFTS.
Final Report.
E. P. Keath. May 74, 8p NASA-CR-138172
Contract NGR-44-004-121

Descriptors: *Bibliographies, *Pioneer 6 space probe, *Pioneer 9 space probe, *Solar cosmic rays, Data reduction, Flux (Rate), Galactic radiation.

For abstract, see STAR 1213

N74-22428/8GA PC$4.00/MF$1.45
California Inst. of Tech., Pasadena.
COSMIC RAY ISOTOPES.
E. C. Stone. 30 Nov 73, 14p NASA-CR-138166, SRL-73-15
Contract NGR-05-002-160
Conf-Presented at the 13TH Intern. Cosmic Ray Conf., Denver, 26 Aug. 1973.

Descriptors: *Abundance, *Cosmic rays, *Ionization cross sections, *Radioactive isotopes, *Stellar radiation, Aluminum isotopes, Beryllium isotopes, Helium isotopes, Hydrogen isotopes, Iron isotopes, Radiochemistry, Stellar evolution.

For abstract, see STAR 1213

N74-22429/6GA PC$4.00/MF$1.45
Maryland Univ., College Park.
SIMULATION OF COLLIDING SOLAR WIND STREAMS WITH MULTIFLUID CODES.
K. Papadopoulos, R. W. Clark, and C. E. Wagner. Apr 74, 14p NASA-CR-138174
Contract NGL-21-007-005

Descriptors: *Magnetohydrodynamic flow, *Solar wind, *Transport properties, Applications of mathematics, Coefficients, Collisions, Electric fields, Magnetic fields, Magnetohydrodynamic stability.

For abstract, see STAR 1213

N74-22435/3GA PC$4.00/MF$1.45
Osservatorio Astronomico, Rome (Italy).
PROPOSAL FOR ULTRAVIOLET INVESTIGATIONS ON EMISSION LINES OBJECTS WITH THE IUE SATELLITE.
G. B. Baratta, A. Cassatella, and R. Viotti. Oct 73, 8p RR-11

Descriptors: *Iue, *Line spectra, *Stellar spectra, *Ultraviolet spectra, Chemical composition, Emission spectra, Interstellar extinction, Mission planning, Program trend line analysis, Satellite observation, Spectrum analysis, Stars, Stellar spectrophotometry.

For abstract, see STAR 1213

N74-22440/3GA PC$4.00/MF$1.45
Kanner (Leo) Associates, Redwood City, Calif.
MARS IN THE EYES OF GEOLOGISTS.
B. Konovalov. May 74, 10p NASA-TT-F-15577
Contract NASW-2481
Tran-Transl. Into English from Izv., 20 Mar. 1974 p 5, Cols. 1-4.

Descriptors: *Earth planetary structure, *Geochronology, *Mars (Planet), Geomorphology, Lunar geology, Volcanology.

For abstract, see STAR 1213

N74-22442/9GA PC$4.00/MF$1.45
Techtran Corp., Glen Burnie, Md.
THE GAS PRODUCTION OF COMETS.
W. F. Huebner. Feb 74, 18p NASA-TT-F-14789
Contract NASW-2485
Tran-Transl. Into English from Z. Astrophys. (Heidelberg), V. 63, 1965 p 22-34.

Descriptors: *Comets, *Gas evolution, *Solar radiation, Heat of vaporization, Numerical analysis, Thermodynamic properties.

For abstract, see STAR 1213

N74-22445/2GA PC$4.00/MF$1.45
Linguistic Systems, Inc., Cambridge, Mass.
ESTIMATES OF WATER CONTENT IN THE ATMOSPHERE OF VENUS ACCORDING TO DATA FROM RADIO-ASTRONOMICAL MEASUREMENTS AND SPACE PROBES.
A. Y. Basharinov, B. G. Kutuza, D. Y. Martynov, and V. A. Bronshten. Apr 74, 8p NASA-TT-F-15428
Contract NASW-2482
Tran-Transl. Into English from the Book "Fizika Luny I Planet" Moscow, Nauka Press, 1972 p 375-377.

Descriptors: *Moisture content, *Radio astronomy, *Space probes, *Venus atmosphere, Absorption spectra, Carbon dioxide, Cloud cover, Superhigh frequencies, Water vapor.

For abstract, see STAR 1213

N74-22446/0GA PC$4.25/MF$1.45
Kanner (Leo) Associates, Redwood City, Calif.
MEASUREMENT OF LOW-ENERGY PARTICLES BY THE MARS-2 AND MARS-3 PLANETARY PROBES. 2: PRELIMINARY RESULTS.
O. L. Vaysberg. Apr 74, 24p NASA-TT-F-15540
Contract NASW-2481
Tran-Transl. Into English from Kosm. Issled. (Moscow), V. 11, No. 5, Sep. - Oct. 1973 p 143-755.

Descriptors: *Charged particles, *Mars 2 spacecraft, *Mars 3 spacecraft, Alpha particles, Energy spectra, Helium ions, Proton density (Concentration), Shock waves, Solar wind.

For abstract, see STAR 1213

N74-22447/8GA PC$5.25/MF$1.45
Massachusetts Inst. of Tech., Cambridge. Dept. of Earth and Planetary Sciences.
WIND SPEEDS IN LOWER ATMOSPHERE OF VENUS: STATUS REPORT ON POSSIBLE MEASUREMENT VIA DIFFERENTIAL VLBI TRACKING OF ENTRY PROBES.
Final Report.
I. I. Shapiro. May 72, 41p
Contract NGR-22-009-694

Descriptors: *Interferometry, *Venus atmosphere, *Venus probes, *Wind velocity, Error analysis, Lower atmosphere, Mathematical models, Transponders, Wind measurement.

For abstract, see STAR 1213

N74-22448/6GA PC$6.25/MF$1.45
California Univ., Berkeley. Space Sciences Lab.
DATA PROCESSING OF MARTIAN TOPOGRAPHIC INFORMATION OBTAINED FROM GROUND-BASED RADAR AND SPECTROSCOPY AND FROM MARINERS 6 AND 7. MARTIAN TOPOGRAPHY ELEVATIONS: DATA PROCESSING.
Final Report, 1 Feb. 1971 - 31 Jul. 1972.
K. A. Anderson. 14 Mar 74, 63p NASA-CR-138136, SSL-SER-15-ISSUE-14
Contract NGR-05-003-431

Descriptors: *Data processing, *Gas spectroscopy, *Mapping, *Mars surface, *Topography, Cloud physics, Contours, Earth crust, Elevation, Geophysics, Lunar crust, Mariner 6 space probe, Mariner 7 space probe.

For abstract, see STAR 1213

N74-22449/4GA PC$12.75/MF$1.45
Smithsonian Astrophysical Observatory, Cambridge, Mass.
INTERDISCIPLINARY STUDIES OF SAMPLES FROM BOULDER 1, STATION 2, APOLLO 17, VOLUME 1.
15 Mar 74, 194p NASA-CR-138126, SAO-403-003
Contract NGL-09-015-150

Descriptors: *Apollo 17 flight, *Chemical composition, *Geochronology, *Geomorphology, *Lunar landing sites, *Lunar rocks, Anorthosite, Basalt, Breccia, Lunar evolution, Lunar geology, Lunar maria, Minerals, Petrology, Pyroxenes.

For abstract, see STAR 1213

N74-22462/7GA PC$5.75/MF$1.45
California Univ., Berkeley. Space Science Lab.
PETROGRAPHIC AND CRYSTALLOGRAPHIC STUDY OF SILICATE MINERALS IN LUNAR ROCKS.
Final Report, 1 Feb. 1971 - 31 Jan. 1972.

I. S. E. Carmichael, F. J. Turner, and H. R. Wenk. 25 Mar 74, 54p NASA-CR-138147, SSL-SER-15-ISSUE-17
Contract NGR-05-003-414

Descriptors: *Crystal structure, *Lunar rocks, *Minerals, *Optical measurement, *Silicates, Minerals, Optical properties, Petrography, Radiography.

For abstract, see STAR 1213

N74-22466/8GA PC$4.00/MF$1.45
Scientific Translation Service, Santa Barbara, Calif.
MEASUREMENT OF A VARIABLES IN THE INTEGRAL ELECTRON CONCENTRATION ON THE MARS-2 COMMUNICATION LINE BY THE DISPERSION INTERFEROMETER METHOD.
N. A. Savich, V. V. Andreyanov, Y. I. Bekhterev, M. B. Vasilyev, and A. S. Vyshlov. May 74, 13p NASA-TT-F-15541
Contract NASW-2483
Tran-Transl. Into English from Kosm. Issled. (Moscow), V. 11, No. 5, 1973 p 756-760.

Descriptors: *Electron density (Concentration), *Interferometers, *Mars 2 spacecraft, Corpuscular radiation, Graphs (Charts), Ionospheric propagation, Mathematical models, Radio communication, Time measurement.

For abstract, see STAR 1213

N74-22467/6GA PC$4.00/MF$1.45
Kanner (Leo) Associates, Redwood City, Calif.
MARS-3: ASTROPHYSICAL STUDY OF THE LOWER ATMOSPHERE AND PLANET SURFACE.
V. I. Moroz, L. V. Ksanfomaliti, and A. E. Nadzhip. Apr 74, 6p NASA-TT-F-15543
Tran-Transl. Into English from USP. Fiz. Nauk (Ussr), V. 111, No. 3, Oct. 1973 p 360-370. Subm-Sponsored by NASA.

Descriptors: *Mars atmosphere, *Mars surface, *Mars 3 spacecraft, Atmospheric temperature, Brightness temperature, Moisture content, Photometry, Planetary mapping.

For abstract, see STAR 1213

N74-22468/4GA PC$6.25/MF$1.45
New Mexico Univ., Albuquerque. Dept. of Geology.
ELECTRON MICROPROBE ANALYSES OF LITHIC FRAGMENTS AND THEIR MINERALS FROM LUNA 20 FINES.
Special Publication No. 12.
G. H. Conrad, P. F. Hlava, J. A. Green, R. B. Moore, and G. Moreland. 1973, 64p NASA-CR-138148
Contract NGL-32-004-063

Descriptors: *Electron microscopes, *Lunar rocks, *Photomicrography, Chemical analysis, Mineralogy, Structural properties (Geology), Weight analysis.

For abstract, see STAR 1213

N74-22469/2GA PC$5.50/MF$1.45
Yale Univ., New Haven, Conn.
SOME CALCULATIONS PERTAINING TO THE FEASIBILITY OF MEASURING LUNAR HEAT FLOW.
Final Report.
S. P. Clark, Jr.. Sep 65, 46p NASA-CR-138133
Contract NGR-07-004-039

Descriptors: *Heat transmission, *Moon, Cavities, Flow measurement, Lunar topography.

For abstract, see STAR 1213

N74-22470/0GA PC$4.50/MF$1.45
Toledo Univ., Ohio. Ritter Astrophysical Research Center.
THE ALBEDO OF PARTICLES IN REFLECTION NEBULAE.
W. F. Rush. 10 Jan 74, 28p NASA-CR-138134
Contract NGR-36-010-016

Descriptors: *Albedo, *Nebulae, *Particles, *Stellar luminosity, Anisotropy, Continuous radiation, Interstellar matter, Isotropy, Magnitude, Optical thickness.

For abstract, see STAR 1213

N74-22471/8GA PC$6.00/MF$1.45
National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.
PHOTODOCUMENTATION OF LONG-TERM LUNAR SURFACE EXPOSURE EXPERIMENT.
F. Hoerz. Feb 74, 59p NASA-TM-X-58125, JSC-08676

Descriptors: *Apollo 17 flight, *Lunar photographs, *Lunar topography, Documentation, Photographic processing, Reference systems.

For abstract, see STAR 1213

N74-22472/6GA PC$5.00/MF$1.45
Scientific Translation Service, Santa Barbara, Calif.
INDICATIONS OF THE ERUPTIVE DEVELOPMENT OF PLANETARY BODIES.
S. K. Vsekhsvyatskiy. Jun 74, 36p NASA-TT-F-15519
Contract NASW-2483
Tran-Transl. Into English from the Book "Problemy Kosmicheskoy Fiziki" Kiev, Kiev Univ. Press, 1971 p 73-94.

Descriptors: *Planetary composition, *Planetary evolution, Comets, Energy dissipation, Planetary rotation, Volcanoes.

For abstract, see STAR 1213

N74-22485/8GA PC$4.00/MF$1.45
Osservatorio Astronomico, Rome (Italy).
SOLAR PHENOMENA.
Monthly Bulletin, Dec. 1973.
M. Cimino. Dec 73, 9p PUBL-188

Descriptors: *Astronomical observatories, *Sunspots, Italy, Periodic variations, Solar magnetic field, Solar spectra, Tables (Data).

For abstract, see STAR 1213

SLA-74-117 PC$6.50/MF$1.45
Sandia Labs., Albuquerque, N.Mex. (Usa).
ROCKET OPERATIONS PLAN. AUSTRALIAN ECLIPSE JUNE 1974.
Mar 74, 67p
Contract AT(29-1)-789

Descriptors: (*Sun, *Eclipse), Australia, Density, Distribution, Hydrogen, Lyman lines, Photosphere, Rockets, Solar corona, Solar wind, Spatial distribution, Temperature measurement, Usa.

For abstract, see NSA 30 01, number 02420.

SLA-74-90 PC$4.00/MF$1.45
Sandia Labs., Albuquerque, N.Mex. (Usa).
PHOTOGRAPHIC TECHNIQUE TO DETERMINE THE APPARENT ENERGY DISTRIBUTION OF THE SOLAR AUREOLE.
C. E. Robertson, and J. H. Banker. Mar 74, 11p
Contract AT(29-1)-789

Descriptors: (*Photographic film detectors, *Solar energy), Photographic films, Silver.

For abstract, see NSA 30 01, number 02199.

4. ATMOSPHERIC SCIENCES

4A. Atmospheric Physics

AD-780 545/0GA PC$3.75/MF$1.45
Utah State Univ Logan Electro-Dynamics Lab
DEVELOPMENT OF A LIQUID NITROGEN COOLED FIELD WIDENED INTERFEROMETER.
Final rept. 1 Feb 72-30 Nov 73,
Allan Steed, and Ralph H. Haycock. 1 Dec 73, 52p AFCRL-TR-74-0012
Contract F19628-72-C-0156

Descriptors: *Atmospheric physics, *Emission spectra, *Interferometers, Infrared spectra, Night sky, Airborne.
Identifiers: KC-135 aircraft.

Under contract with Air Force Cambridge Research Laboratories, personnel from Electro-Dynamics Laboratories at Utah State University have developed an infrared measurement system for installation in a KC 135 aircraft. The system consists of a liquid nitrogen cooled, field widened interferometer spectrometer incorporated in a cryogenic housing and the attendant control console. The interfereometer is cooled to liquid nitrogen temperature and the detector is further cooled to liquid helium temperature. A special top plate for the interferometer housing was designed and built which allows the instrument to be used on the ground. Frosting is prevented on the optical port by using cold dry nitrogen gas as a thermal barrier between the window and the atmosphere. Using the ground based system the emission spectra of the night sky from 1 - 2.7 micrometer has been resolved in less than 10 seconds. A measurement made at White sands, New Mexico is included as part of this report. (Modified author abstract)

AD-780 552/6GA PC$3.25/MF$1.45
Raytheon Co Sudbury Mass
THE ANGULAR DISTRIBUTION OF SPREAD-F RETURNS FROM AN ARTIFICIALLY MODIFIED IONOSPHERE.
Final technical rept. Jan 73-Feb 74,
E. M. Allen, G. D. Thome, P. B. Rao, and R. L. St. Germain. Feb 74, 40p RADC-TR-74-114-Pt-2
Contract F30602-73-C-0154
See also Part 3, AD-780 553.

Descriptors: *Ionospheric modification, *Heating, Ionospheric propagation, High frequency, Electromagnetic wave reflections, Ionospheric disturbances.
Identifiers: Spread F.

A 32 element HF phased array has been used to study the angular spectrum of spread-F returns from an ionosphere modified by the powerful radio frequency heater transmitter at Platteville, Colorado. The diagnostic radar is a coherent pulse system which provides an angular resolution of 2.7 degrees in azimuth and elevation at the midband frequency of 7.5 MHz, a range resolution of 30 Km, and a Doppler resolution of 0.08 Hz. The results are presented in the form of sky maps (brightness versus azimuth and elevation) of the returns as a function of group delay Doppler shift, polarization, and sounding frequency. The principal result is that the returns which suffer the greatest group delay at a given sounding frequency come from a direction looking up the earth's magnetic field and exhibit negative Doppler shift. (Modified author abstract)

AD-780 553/4GA PC$3.75/MF$1.45
Raytheon Co Sudbury Mass
THEORETICAL STUDIES OF IONOSPHERIC HEATING BY POWERFUL RADIO WAVES.
Final technical rept. Jan 73-Feb 74,
Gerald Meltz, and Lowell H. Holway, Jr. Feb 74, 67p RADC-TR-74-114-Pt-3
Contract F30602-73-C-0154
See also Part 2, AD-780 552.

Descriptors: *Ionospheric modification, *Heating, Ionospheric propagation, High frequency, Radio waves, Gravity waves, Electron energy, Electron density.
Identifiers: Plasma heating.

In addition to the communication applications of FAS, ionospheric heating by powerful radio waves holds promise for establishing new techniques in the aeronomy of the D, E and F-regions. This report discusses the observed phenomena associated with the absorption of intense HF waves in the context of present theoretical understanding. The authors develop the fundamentals of ionospheric heating theory and apply it to the prediction of large scale electron temperature and density changes in both the D and F-layers. Generation of gravity waves by heating is also examined. (Modified author abstract)

AD-780 555/9GA PC$3.25/MF$1.45
General Electric Co Philadelphia Pa Re-Entry and Environmental Systems Div
METHODS FOR RELEASING METAL VAPORS IN THE UPPER ATMOSPHERE.
Final rept. Apr 73-Feb 74,
Peter D. Zavitsanos, and Joseph A. Golden. May 74, 36p RADC-TR-74-138
Contract F30602-73-C-0255, ARPA Order-1649

Descriptors: *Atmospheric sounding, *Upper atmosphere, Metal vapors, Intermetallic compounds, Aluminum, Vaporization, Chemical reactions, Thermochemistry.
Identifiers: *Chemical release studies.

Based on the exothermic nature of intermetallic reactions techniques have been developed which are capable of generating high temperatures in the condensed phase. By proper selection, based on the relative vapor pressures of all the components, it is possible to selectively vaporize metals for atmospheric release applications. Two intermetallic systems were successfully tested in the laboratory for the release of atom aluminum. They are: Pd(s) + Al(s)-xes yields PdAl(1) + Al(g); Ti(s) + 2B(s) + Al(s) yields TiB2(s) + Al(g). Yields were determined for both reactions. The first reaction was used in releasing aluminum in the upper atmosphere at altitudes 145 Km and 125Km. Observations were made on the AlO clouds which were presumably formed by O2 attack on Al, Al + O2 yields AlO + O and subsequent photoluminescence of AlO by sunlight. (Author)

AD-780 620/1GA PC$3.75/MF$1.45
Air Force Cambridge Research Labs L G Hanscom Field Mass
HIGH ALTITUDE EFFECTS SIMULATION (HAES) PROGRAM. REPORT NO. 1. ROCKET LAUNCH OF A SWIR SPECTROMETER INTO AN AURORA (ICECAP 72).
Environmental research papers,
Doran J. Baker, Clair L. Wyatt, William R. Pendleton, Jr., and James C. Ulwick. 5 Feb 74, 54p Rept nos. AFCRL-TR-74-0077, AFCRL-ERP-466

Descriptors: *Infrared spectrometers, *Atmospheric sounding, *Aurorae, Sounding rockets, Payload, Infrared spectra, Emission spectra, Carbon dioxide, Arctic regions.
Identifiers: HAES program.

An Astrobee D rocket (A30.205-4) was launched at Poker Flat, Alaska, on 9 March 1972 at 1052 hours UT during a condition of Class IBC2 post-breakup auroral display. A near-zenith spectral radiance profile was obtained from 48.5 km to an apogee of 91.9 km on ascent, and from 91.9 km down to about 84.7 km on descent, using a circular variable-filter spectrometer. About 268 spectral scans were obtained during flight, covering the range from 1.4 to 5.0 micrometer at a resolution of about 4 per cent. The dominant emission feature was at 4.3 micrometer, which is attributed to the CO2 nu(3) fundamental. The upward-viewed spectral radiance appeared to range from about 45 MR/micrometer at 48.5 km to less than 2 MR/micrometer at 92 km. A volume-emission-rate/altitude profile for the nu(3) fundamental of CO2 is presented. The profile is based on a simple LTE model and neglects radiation transport. As a result, the model cannot be compared directly with the data. A more complete analysis of the problem is in progress. (Author)

AD-780 639/1GA PC$3.00/MF$1.45
Air Force Cambridge Research Labs L G Hanscom Field Mass
MOLECULAR OXYGEN MEASUREMENTS FROM UV ABSORPTION.
Environmental research papers,
Lawrence H. Weeks. 27 Feb 74, 24p Rept nos. AFCRL-TR-74-0109, AFCRL-ERP-469

Descriptors: *Oxygen, *Gas analysis, *Upper atmosphere, Spectral lines, Solar ultraviolet radiation, Ultraviolet spectra, Absorption(Physical), Concentration(Composition), Absorption cross sections.
Identifiers: *Spectroscopic analysis, Atmospheric composition.

A series of sounding rockets were launched to study the atmosphere over a day-night period. Part of this program consisted of two optical payloads for molecular oxygen. The molecular oxygen concentration was obtained from Lyman-alpha and 1450A sensors. Here the method of analysis for molecular oxygen is discussed and the results presented and compared with models and other data. The molecular oxygen concentration is measured by the technique of absorption spectroscopy, using the sun as a light source.

AD-780 659/9GA PC$10.50/MF$1.45
Utah State Univ Logan Center for Research in Aeronomy
INFRARED RADIANCE MODEL FOR THE AURORALLY DISTURBED ATMOSPHERE.
Final rept. 1 Aug 71-31 Aug 73,
Richard H. Bishop, Ruey Y. Han, Alan W. Shaw, and Lawrence R. Megill. 31 Aug 73, 149p AFCRL-TR-73-0527
Contract F19628-71-C-0257, ARPA Order-1366

Descriptors: *Aurorae, *Infrared radiation, Carbon dioxide, Nitrogen oxides, Methane, Water vapor, Oxygen, Nitrogen, Carbon monoxide, Distribution, Radiance.
Identifiers: Hydroxyl radical.

Recently, auroral observations have indicated the strong enhancement of certain infrared bands during periods of auroral activity. A theoretical model has been created in order to study the infrared processes associated with the aurora. The quantitative results of this study depend upon a thorough knowledge of the rates of all processes involved. Some of the rate constants are well known while for others only the crudest approximation is made. Qualitatively, however, results indicate that certain infrared bands of CO2, N2O, NO, and NO+ are strongly enhanced during periods of auroral activity. This is primarily the result of two basic energy exchange mechanisms. The energy deposited by the primary auroral electron flux goes into increasing the internal energy of N2, O2, and O. In addition to energetic auroral particles as an energy source, electric fields are also considered. Qualitatively the results are similar except that the energy tends to be deposited at altitudes somewhat higher than in direct precipitation processes. (Modified author abstract)

AD-780 864/5GA Reprint
Air Force Cambridge Research Labs L G Hanscom Field Mass
THE STRUCTURE OF THE TWO-DIMENSIONAL INTERNAL BOUNDARY LAYER OVER A SUDDEN CHANGE OF SURFACE ROUGHNESS,
K. S. Rao, J. C. Wyngaard, and O. R. Cote. 5 Dec 73, 12p Rept no. AFCRL-TR-74-0259
Revision of report dated 17 Aug 73.
Availability: Pub. in Jnl. of Atmopsheric Sciences, v31 n3 p738-746 Apr 74.

Descriptors: *Atmospheric circulation, *Turbulent boundary layer, Turbulent flow, Boundary layer, Surface roughness, Mathematical models, Partial differential equations, Numerical analysis.

The effects of an abrupt change of surface roughness on the mean flow and turbulence structure in the neutral surface layer are numerically investigated by a higher-order turbulence closure theory, which includes dynamical equations for Reynolds stresses and the viscous dissipation rate. The closed system of governing equations, together with the specified initial and boundary conditions, is solved by an explicit finite-difference method on a digital computer. The numerical model predicts the distributions of mean wind, shear stress, turbulent energy and other quantities, with no a priori assumptions regarding the distributions of any of these variables in the transition region. The distribution of the nondimensional wind shear, the dissipation and mixing length scales, and the ratio of stress to turbulent kinetic energy are shown to differ significantly from their equilibrium flow variations. (Author)

AD-780 875/1GA Reprint
Air Force Cambridge Research Labs L G Hanscom Field Mass
COMPARISON OF ELECTRON FLUXES WITH THE WHISTLER SELF-EXCITATION LIMIT DURING A MAGNETIC STORM,
Paul L. Rothwell. 20 Apr 72, 6p Rept no. AFCRL-TR-74-0246
Availability: Pub. in Annales de Geophysique, v29 n3 p431-434 1973.

Descriptors: *Magnetic storms, *Whistlers, *Electron flux, Scientific satellites, Spectrometry.
Identifiers: OV1-13 satellite.

The measurements from a magnetic spectrometer flown on board Air Force satellite OV1-13 during the magnetic storm of June 9, 1968 show that a large number of 115- and 180-keV electrons were injected into the outer radiation belt and remained there throughout the storm period. It is shown that these fluxes are consistent with an equatorial energy spectrum in served enhancement of MeV electrons off the equator. (Author)

AD-780 878/5GA Reprint
Air Force Cambridge Research Labs L G Hanscom Field Mass
VIBRATIONAL TEMPERATURE AND MOLECULAR DENSITY OF THERMOSPHERIC NITROGEN MEASURED BY ROCKET-BORNE ELECTRON BEAM INDUCED LUMINESCENCE,
R. R. O'Niel, W. R. Pendleton, Jr., A. M. Hart, and A. T. Stair, Jr. 17 Jan 74, 19p Rept no. AFCRL-TR-74-0243
Revision of report dated 9 Aug 73.
Availability: Pub. in Jnl. of Geophysical Research, v79 n13 p1942-1958, 1 May 74.

Descriptors: *Thermosphere, *Nitrogen, Ions, Molecular energy levels, Temperature, Molecular vibration, Density, Electron beams, Electron irradiation, Luminescence, Rocketborne, Molecular spectroscopy, Aurorae.

The vibrational temperature molecular density of thermospheric nitrogen were probed in situ above Fort Churchill, Manitoba, Canada, on 13 March 1970. The rocket-borne system used electron-beam-induced luminescence of the atmosphere as a diagnostic technique in effecting the measurements. The vibrational populations of N2(+) ions in the B doublet sigma (u)(+) state were inferred from the intensities of selected transitions induced by 2.5 keV electron impact. Four narrow-band photometers were used to measure the radiant intensity of the transitions

AD-780 936/1GA PC$3.75/MF$1.45
Alaska Univ College Geophysical Inst
NOCTILUCENT CLOUD OBSERVATIONS COORDINATED WITH ROCKET TEMPERATURE SOUNDINGS IN CENTRAL ALASKA.
Final rept. 15 Jul-30 Nov 73,
William J. Stringer. 20 Mar 74, 59p Rept no. UAG-NLC-73 AROD-11891.1-EN
Grant DA-ARO-D-31-124-73-G201

Descriptors: *Noctilucent clouds, *Atmospheric temperature, *Alaska, Mesosphere, Sounding rockets, Profiles, Sky brightness, Curve fitting, Graphics.

During the summer of 1973, the Geophysical Institute and the U.S. Army Meteorological Rocket Program cooperated in a small joint study to determine whether any correlation could be found between the appearance of noctilucent clouds and lower mesospheric temperature profiles. Noctilucent cloud observations were performed by the Geophysical Institute while mesospheric temperature profiles were obtained for altitudes below 70 km by parachute-borne thermistors released from standard 'Dart' payloads carried aloft by 'Super Loki' rocket motors. Temperature profiles obtained from grenade temperature soundings were used to extrapolate the lower mesospheric temperature profiles to the mesopause. Successful observations required temperature profiles to be obtained during clear sky conditions. (Modified author abstract)

AD-780 997/3GA Reprint
Air Force Cambridge Research Labs L G Hanscom Field Mass
HYDROMAGNETIC PROPAGATION IN THE MAGNETOSPHERE: A MECHANICAL ANALOGUE FOR THE STUDY OF THE INITIAL VALUE PROBLEM OF COUPLED MODES.
Henry R. Radoski. 14 Jun 73, 26p Rept no. AFCRL-TR-74-0218
Availability: Pub. in Jnl. of Geomagnetism and Geoelectricity, v25 p363-386 1973.

Descriptors: *Magnetosphere, Magnetohydrodynamics, Wave equations, Plasmas(Physics), Geomagnetism, Pulsation.
Identifiers: *Magnetohydrodynamic waves, Geomagnetic micropulsations.

Several alternative analyses of the steady state solutions of coupled modes have been proposed. In determining which, if any, steady state solution is of physical significance, the manner in which the hydromagnetic system evolves from an initial disturbance would be decisive. The basic initial value problems are those of field line excitation and relaxation. These two cases correspond to the energy being initially in the poloidal or toroidal modes. These difficult problems are investigated by establishing the relevance of a simple mechanical analogue which is studied in detail. This is accomplished in three stages. (Modified author abstract)

AD-781 028/6GA PC$4.00/MF$1.45
Army Foreign Science and Technology Center Charlottesville Va
FAST-RESPONSE RADIOMETER AND ANALYSIS OF A MERCURY-ALLOYED GERMANIUM RADIATION RECEIVER.
Yu.-A. R. Mullamaa. 12 Apr 74, 20p Rept no. FSTC-HT-124-74
Trans. of mono. Stokhasticheskaya Struktura Polei Oblachnosti i Radiatsii, Tartu, 1972 p55-70.

Descriptors: *Radiometers, *Atmospheric physics, Pyrometers, Radiation measuring instruments, Radiative transfer, Translations, USSR.
Identifiers: *Atmospheric radiation.

A fast-response radiometer-pyrometer for measuring low-level fluctuations in radiation temperature or brightness of natural formations, including clouds, is described. The effect of unmodulated radiation on receiver parameters is discussed.

AD-781 040/1GA PC$3.25/MF$1.45
Air Force Cambridge Research Labs L G Hanscom Field Mass
PULSE SOUNDING WITH CLOSELY SPACED RECEIVERS AS A TOOL FOR MEASURING ATMOSPHERIC MOTIONS AND FINE STRUCTURE IN THE IONOSPHERE. V. PERIOD OF CHEMICAL RELEASES AS EXAMPLE OF SPECTRAL ANALYSIS.
Environmental research papers,
W. Pfister. 22 Feb 74, 44p Rept nos. AFCRL-ERP-468, AFCRL-TR-74-0105
See also Part 4. AD-712 346.

Descriptors: *Atmospheric sounding, *Ionosphere, Spectrum analysis, Atmospheric motion, Data processing, Perturbations.

The report gives a detailed description of the different steps in the processing of 'drift' data taken with the Complex Amplitude Multifrequency Scanner (CAMS). The raw data together with preface information are digitally recorded in a format suitable for a 'digicoder' printout. They are spectrum analyzed in two steps: Fourier spectra and combined power, phase and coherency spectra. Output is provided either as computer plot or as tape for 'digicoder' printout. The last step is a DAASM (Doppler and Arrival Angle Measurement) display. As illustration for all these steps in the data processing an E sub S event was chosen which appeared one hour after chemical releases from rockets. Only minor attention has been given to the interpretation of the processed data. (Author)

AD-781 043/5GA PC$3.00/MF$1.45
Air Force Cambridge Research Labs L G Hanscom Field Mass
PULSE SOUNDING WITH CLOSELY SPACED RECEIVERS AS A TOOL FOR MEASURING ATMOSPHERIC MOTIONS AND FINE STRUCTURE IN THE IONOSPHERE. VI. SPECTRAL ANALYSIS OF INTERLACED SETS OF DATA.
Environmental research papers,
W. Pfister. 7 Mar 74, 22p Rept nos. AFCRL-TR-74-0125, AFCRL-ERP-470
See also AD-781 040.

Descriptors: *Atmospheric sounding, *Ionosphere, Atmospheric motion, Doppler effect, Fourier analysis, Spectrum analysis.
Identifiers: *Echo sounding, *Pulse echo technique.

A pulse sounding system, like LTIRF's complex amplitude multifrequency scanner (CAMS), can be used to sample the returned echo on many parameters (antennas, frequencies, range gates). If the number of parameters is reduced, the sampling rate can be increased and used in a spectrum analysis either to improve the signal-to-noise ratio or to extend the Doppler range. The fact that for this application the data are not equally spaced, but consist of two, three or more interlaced sets of equally spaced data, requires a special treatment. The problem is formulated with three sets, according to the format of CAMS. Examples of spectral measurements are included. The case for two or four interlaced sets is discussed in Appendixes A and B. (Author)

AD-781 094/8GA PC$3.75/MF$1.45
Mission Research Corp Santa Barbara Calif
STIMULATED SKYGLOW.
Final technical rept. 1 Aug-31 Dec 73,
D. H. Archer, and P. W. Tarr. Jan 74, 73p Rept no. MRC-R-107 RADC-TR-74-109
Contracts F30602-71-C-0374, DNA001-73-C-0239

Descriptors: *Aurorae, *Atmosphere models, Atmospheric physics, Electron flux, Radiative transfer, Infrared radiation, Chemical reactions, Luminescence, Emission spectra, Nitrogen, Oxygen, Carbon dioxide.
Identifiers: ARCTIC computer program.

The report describes the development of a code, called ARCTIC, that is suitable for the study and analysis of auroral data. The code inputs a flux spectrum of primary electrons, incident on or in the atmosphere, with a specified magnetic dip angle and initial pitch angle, and computes the detailed energy deposition and partition in the atmosphere. The deposition subroutine is coupled to a chemistry and radiation subroutine with the result that the optical/infrared emission, as functions of altitude and time, are then determined. The code is essentially complete, except for certain refinements, and has been run for the case of a hypothetical class II + aurora. (Author)

COM-74-50087-356/GA MF$1.45
National Geophysical and Solar-Terrestrial Data Center, Boulder, Colo.
IONOSPHERIC DATA. APRIL 1974.
Apr 74, 120p NOAA-FA-356 NOAA-74052003
Paper copy available from National Climatic Center, Federal Building, Asheville, N.C. 28801. Attn: Publications. $10.00/year, $1.00/copy.

Descriptors: *Ionosphere, Statistical data, Tables(Data), Ionospheric disturbances, Sunspots, Ionospheric propagation, Electron density, Diurnal variations, Whistlers, Noise(Radio).

Beginning with the January 1973 issue the contents of Ionospheric Data have been changed from the traditional publication of all monthly median data available at the time of issue, regardless of the data of observation. The publication now contains monthly medians only for the same month the publication is issued. For example, the January 1973 issue includes all the data available for January 1973 and any previous unpublished data for January from earlier years. Also published are detailed data for the same month from an exemplary station, Wallops Island (Washington) including daily-hourly values of all characteristics, f-plots for Regular World Days, and an N(h) contour graph. As timely information, there is included selected ionospheric data for a Retrospective World Interval, when appropriate. Also given is information on ionospheric data recently received at World Data Center A for Solar-Terrestrial Physics and other information on availability of data from the WDC's. This issue also contains tables and graphs of monthly median ionospheric data for April 1957 and each April to that of 1973.

COO-2249-3 PC$7.75/MF$1.45
Massachusetts Inst. Of Tech., Cambridge (Usa). Dept. Of Meteorology.
TRANSPORT PROCESSES AND TRACE CONSTITUENTS IN THE STRATOSPHERE. ANNUAL PROGRESS REPORT.
D. M. Cunnold. 15 Mar 74, 91p
Contract AT(11-1)-2249

Descriptors: (*Stratosphere, *Heating), (*Ozone, *Chemical reactions), Aerosols, Chemical reaction kinetics, Nitrogen oxides, Photochemistry, Statistical models, Emission, Sulfates, Sulfur oxides, Sulfuric acid, Supersonic transport.

For abstract, see NSA 30 01, number 02276.

N74-22028/6GA PC$6.25/MF$1.45
Pennsylvania State Univ., University Park. Ionosphere Research Lab.
EFFECT OF ENERGETIC ATOMIC OXYGEN AND NITROGEN ON NEUTRAL DENSITY MODELS.
R. P. Rohrbaugh. 2 Apr 74, 63p NASA-CR-136908, PSU-IRL-SCI-423
Contracts WGL-39-009-003, N00014-67-A-0385-0017

Descriptors: *Atmospheric models, *Atomic recombination, *Nitrogen atoms, *Oxygen atoms, Atomic collisions, Ballistic trajectories, F region, Mathematical models, Neutral particles, Probability distribution functions.

For abstract, see STAR 1213

N74-22029/4GA PC$5.75/MF$1.45
Pennsylvania State Univ., University Park. Ionosphere Research Lab.
ULTRAVIOLET SOURCE FOR ROCKET MEASUREMENTS OF NITRIC OXIDE IN THE UPPER ATMOSPHERE.
J. M. H. Siddiqui. 3 Jan 74, 55p NASA-CR-136909, PSU-IRL-SCI-421-E
Contracts NGR-39-009-218, DA-ARO(D)-31-124-72-G158

Descriptors: *D region, *Nitric oxide, *Ultraviolet radiation, Krypton, Photons, Radio frequency discharge, Rocket sounding, Systems engineering.

For abstract, see STAR 1213

N74-22033/6GA PC$4.25/MF$1.45
Auckland Univ. (New Zealand). Radio Research Centre.
INVESTIGATIONS OF THE IONOSPHERIC USING RADIO SIGNALS FROM ARTIFICIAL SATELLITES.
Final Report, Dec. 1959 - Nov. 1972.
J. E. Titheridge. Oct 73, 24p NASA-CR-138116
Contract NGR-52-001-001

Descriptors: *Artificial satellites, *Ionospheric disturbances, *Ionospheric sounding, *Radio signals, Electron density (Concentration), Ionospheric propagation, Signal transmission.

For abstract, see STAR 1213

N74-22036/9GA PC$5.25/MF$1.45
Alaska Univ., Fairbanks.
MEASUREMENTS OF OPTICAL AND MIDDAY AURORAS.
G. G. Sivjee. Feb 74, 43p NASA-CR-138156
Contract NGR-02-001-099

Descriptors: *Auroras, *Optical radar, *Spectral bands, Data acquisition, Daytime, Night sky, Satellite observation, Spectrophotometry, Triangulation.

For abstract, see STAR 1213

N74-22044/3GA PC$6.00/MF$1.45
Instituto Geografico y Catastral, Madrid (Spain). Seccion de Geomagnetismo y Aeronomia.
CONTRIBUTION TO THE STUDY OF THE MAGNETIC STORMS FOR 15 MAY AND 17 JUNE, 1972 CONTRIBUCION AL ESTUDIO DE LAS TORMENTAS MAGNETICAS DE LOS DIAS, 15 MAYO Y 17 DE JUNIO DE 1972.
F. A. Y. Delrio. 1973, 56p
Language in Spanish.

Descriptors: *Geomagnetism, *Magnetic storms, Solar flux, Spain, Sunspots, Tables (Data).

For abstract, see STAR 1213

N74-22056/7GA PC$5.00/MF$1.45
City Coll. of the City of New York.
INVESTIGATION OF THE RESPONSES OF THE GENERAL CIRCULATION AT 700 MB TO SOLAR-GEOMAGNETIC DISTURBANCE.
H. L. Stolov, and R. Shapiro. 1973, 35p NASA-CR-138184
Subm-Sponsored by NASA.

Descriptors: *Geomagnetism, *Ionospheric disturbances, Atmospheric circulation, Northern hemisphere, Statistical analysis, Winter.

For abstract, see STAR 1213

N74-22062/5GA PC$6.00/MF$1.45
Institut Royal Meteorologique de Belgique, Brussels.
OZONE OBSERVATIONS OBSERVATIONS D'OZONE 1ER TRIMESTRE 1970.
Quarterly Report, 1970.
1974, 56p QR-1
In French and Dutch.

Descriptors: *Atmospheric cmmposition, *Belgium, *Ozone, Partial pressure, Spectrophotometry, Tables (Data), Temperature distribution.

For abstract, see STAR 1213

N74-22063/3GA PC$4.75/MF$1.45
Institut Royal Meteorologique de Belgique, Brussels.
IONOSPHERIC AND COSMIC RAY OBSERVATIONS OBSERVATIONS IONOSPHERIQUES ET DU RAYONNEMENT COSMIQUE BULLETIN MENSUEL, SEPTEMBRE 1973.
Monthly Bulletin, Sep. 1973.
Sep 73, 31p
In French and Dutch.

Descriptors: *Belgium, *Cosmic rays, *Ionospheric sounding, *Neutron flux density, *Tables (Data), E region, F region, Maximum usable frequency.

For abstract, see STAR 1213

N74-22064/1GA PC$4.75/MF$1.45
Institut Royal Meteorologique de Belgique, Brussels.
IONOSPHERIC AND COSMIC RAY OBSERVATIONS OBSERVATIONS IONOSPHERIQUES ET DU RAYONNEMENT COSMIQUE BULLETIN MENSUEL, OCTOBRE 1973.
Monthly Bulletin, Oct. 1973.
Oct 73, 31p
In French and Dutch.

Descriptors: *Belgium, *Cosmic rays, *Ionospheric sounding, *Neutron flux density, *Tables (Data), E region, F region, Maximum usable frequency.

For abstract, see STAR 1213

N74-22065/8GA PC$4.75/MF$1.45
Institut Royal Meteorologique de Belgique, Brussels.
IONOSPHERIC AND COSMIC RAY OBSERVATIONS OBSERVATIONS IONOSPHERIQUES ET DU RAYONNEMENT COSMIQUE BULLETIN MENSUEL, NOVEMBRE 1973.
Monthly Bulletin, Nov. 1973.
Nov 73, 31p
In French and Dutch.

Descriptors: *Belgium, *Cosmic rays, *Ionospheric sounding, *Neutron flux density, *Tables (Data), E region, Maximum usable frequency, Regions.

For abstract, see STAR 1213

N74-22066/6GA PC$4.50/MF$1.45
Institut Royal Meteorologique de Belgique, Brussels.
GEOPHYSICAL OBSERVATIONS OBSERVATIONS GEOPHYSIQUES BULLETIN MENSUEL, SEPTEMBRE 1973.
Monthly Bulletin, Sep. 1973.
Sep 73, 26p
In French and Dutch.

Descriptors: *Atmospheric electricity, *Belgium, *Cosmic rays, *Geomagnetism, *Ionospheric propagation, *Seismology, Beta particles, Geophysical observatories, Tables (Data).

For abstract, see STAR 1213

N74-22067/4GA PC$4.50/MF$1.45
Institut Royal Meteorologique de Belgique, Brussels.
GEOPHYSICAL OBSERVATIONS OBSERVATIONS GEOPHYSIQUES BULLETIN MENSUEL, OCTOBRE 1973.
Monthly Bulletin, Oct. 1973.
Oct 73, 26p
In French and Dutch.

Descriptors: *Atmospheric electricity, *Belgium, *Cosmic rays, *Geomagnetism, *Ionospheric propagation, *Seismology, Beta particles, Geophysical observatories, Tables (Data).

For abstract, see STAR 1213

N74-22423/9GA PC$6.75/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
PROJECTS SOLRAD AND TIMATION: SPACE RADIATION EXPOSURE.
E. G. Stassinopoulos. 8 May 74, 73p NASA-TM-X-70624, X-601-74-82

Descriptors: *Charged particles, *Earth orbits, *Extraterrestrial radiation, *Solar flux, Geomagnetism, Radiation belts, Solar protons, Spectrum analysis, Tables (Data).

For abstract, see STAR 1213

N74-22424/7GA PC$5.25/MF$1.45
Texas Univ., Dallas.
INVESTIGATIONS OF COSMIC RAY ANISOTROPIES AND THEIR RELATIONSHIP TO CONCURRENT MAGNETIC FIELD DATA.
Final Technical Report.
F. R. Allum. Mar 74, 45p NASA-CR-138127
Contract NGR-44-004-133

Descriptors: *Cosmic rays, *Magnetic fields, Bow waves, Geomagnetism, Magnetopause, Solar flares.

For abstract, see STAR 1213

N74-22425/4GA PC$14.50/MF$1.45
Scientific Translation Service, Santa Barbara, Calif.
COSMIC RAY STUDIES ABOARD ARTIFICIAL EARTH SATELLITES.
N. L. Grigorov, V. V. Akimov, V. Y. Nesterov, I. D. Rapoport, and L. F. Kalinkin. May 74, 230p
NASA-TT-F-15377
Contract NASW-2483
Tran-Transl. Into English of the Book "Izucheniye Kosmicheskikh Luchey NA Iskusstvennykh Sputnikakh Zemli" Moscow, Nauka Press, 1973 172 p.

Descriptors: *Cosmic rays, *Energy spectra, *Proton satellites, *Satellite-borne instruments, Aerospace environments, Ionizing radiation, Nuclear physics, Radiation measurement.

For abstract, see STAR 1213

N74-22427/0GA PC$4.00/MF$1.45
Finnish Meteorological Inst., Helsinki.
CALCULATING LONGWAVE RADIATION TO THE EARTH'S SURFACE IN WINTER MAAN PINNALLE TULEVAN PITKAEAALTOISEN SAETEILYN ARVIOIMISESTA TALVITILANTEISSA.
E. Laitinen. 1973, 18p REPT-45
In Finnish; English Summary.

Descriptors: *Earth surface, *Long wave radiation, *Numerical weather forecasting, Atmospheric temperature, Finland, Radiation absorption, Radiation measurement, Winter.

For abstract, see STAR 1213

N74-22430/4GA PC$4.25/MF$1.45
California Inst. of Tech., Pasadena. Div. of Physics, Mathematics, and Astronomy.

THE ENERGY SPECTRUM OF 0.16 TO 2 MEV ELECTRONS DURING SOLAR QUIET TIMES.
G. J. Hurford, R. A. Mewaldt, E. C. Stone, and R. E. Vogt. Feb 74, 24p NASA-CR-138182, SRL-74-1
Contract NGR-05-002-160

Descriptors: *Energy spectra, *Solar electrons, *Solar flux, Cosmic rays, Explorer satellites, Imp, Spectrometers.

For abstract, see STAR 1213

4B. Meteorology

AD-780 566/6GA PC$5.50/MF$1.45
Florida State Univ Tallahassee Dept of Meteorology
A MULTIPLE-SCALE RESEARCH PROGRAM IN TROPICAL METEOROLOGY.
Quarterly progress rept. no. 10, 1 Feb 72-1 Aug 72,
N. E. LaSeur, and G. A. Dean. Nov 72, 188p
ECOM-0062-10-69
Contract DAAB07-69-C-0062
See also AD-872 688.

Descriptors: *Meteorological data, *Tropical regions, *South America, Wind, Circulation, Patterns, Rainfall, Atmospheric temperature, Meteorological charts, Seasonal variations, Tropical cyclones, Radiosondes.

The report contains results from a study of the larger scales of motion which emerge when monthly-mean values of the various atmospheric parameters are considered. It represents a preliminary attempt to describe the structure of the atmosphere over one of the least well known regions of the tropics, namely, the South American continent. Because of the challenging problems of the region, it was decided to undertake a study of the monthly mean circulation, temperature and rainfall patterns, both for the understanding of relationships among them that might emerge as well as to serve as background for future synoptic studies.

AD-780 571/6GA PC$5.00/MF$1.45
Weather Squadron (12th) Ent AFB Colo
MAP TYPE CATALOG FOR THE TEXAS WINDOW,
Robert C. Sabin, Richard L. Nieman, and Hal W. Wold. Apr 74, 161p Rept no. 12WS-TP-74-4

Descriptors: *Meteorological charts, *Weather forecasting, *Texas, Catalogs, Barometric pressure, Statistical data.
Identifiers: Synoptic meteorology.

A standardized procedure has been developed to determine the synotpic map types which have occurred over a specified area (window). The map catalog is a summarization of information relating to these map types for a particular window. (There is a catalog for each of the 14 windows which cover the United States.) The catalog includes characteristics of the map types and listings of each map in the data base (25 years of surface pressure maps) along with its most similar map type for the Texas window.

AD-780 572/4GA PC$5.00/MF$1.45
Weather Squadron (12th) Ent AFB Colo
MAP TYPE CATALOG FOR THE ALABAMA WINDOW,
Robert C. Sabin, Richard L. Nieman, and Hal W. Wold. May 74, 171p Rept no. 12WS-TP-74-5

Descriptors: *Meteorological charts, *Weather forecasting, *Alabama, Catalogs, Barometric pressure, Statistical data.
Identifiers: Synoptic meteorology.

A standardized procedure has been developed to determine the synoptic map types which have occurred over a specified area (window). The map type catalog is a summarization of information relating to these map types for a particular window. (There is a catalog for each of the 14 windows which cover the United States.) The catalog includes characteristics of the map types and listings of each map in the data base (25 years of surface pressure maps) along with its most similar map type for the Alabama window.

AD-780 579/9GA PC$5.00/MF$1.45
Weataer Squadron (12th) Ent AFB Colo
MAP TYPE CATALOG FOR THE CALIFORNIA WINDOW,
Robert C. Sabin, Richard L. Nieman, and Hal W. Wold. Mar 74, 174p Rept no. 12WS-TP-74-3

Descriptors: *Meteorological charts, *Weather forecasting, *California, Catalogs, Barometric pressure, Statistical data.
Identifiers: Synoptic meteorology.

A standardized procedure has been developed to determine the synoptic map types which have occurred over a specified area (window). The map type catalog is a summarization of information relating to these map types for a particular window. (There is a catalog for each of the 14 windows which cover the United States.) The catalog includes characteristics of the map types and listings of each map in the data base (25 years of surface pressure maps) along with its most similar map type for the California window.

AD-780 643/3GA PC$3.25/MF$1.45
Air Force Cambridge Research Labs L G Hanscom Field Mass
RESIDUAL TEMPERATURE-INDUCED HUMIDITY ERRORS IN THE NATIONAL WEATHER SERVICE RADIOSONDE.
Final rept. Mar 72-Dec 73,
Frederick J. Brousaides, and James F. Morrissey. 28 Feb 74, 39p Rept nos. AFCRL-TR-74-0111, AFCRL-IP-215
See also Part 1, AD-762 484.

Descriptors: *Radiosondes, *Errors, Humidity, Atmospheric temperature, Corrections.

The principal radiosonde currently being procured for both DoD and civilian agencies was recently redesigned by the National Weather Service to incorporate improvements in the design of the humidity duct. This design incorporated the salient features of a modification previously described by the authors. These modifications were designed to minimize the errors in humidity measurement caused by the carbon humidity sensor having a temperature distinct from the ambient temperature. This is a final report of an in-house evaluation of the efficacy of the redesign. Results are presented on the residual errors and techniques for correcting the measured humidities to remove these residuals. (Author)

AD-780 649/0GA PC$3.75/MF$1.45
Air Force Cambridge Research Labs L G Hanscom Field Mass
TEST AND CALIBRATION OF THE AFCRL RAINDROP SPECTROMETER.
Instrumentation papers,
Robert F. Myers. 7 Jan 74, 56p Rept nos. AFCRL-TR-74-0006, AFCRL-IP-212

Descriptors: *Raindrops, *Spectrometers, Particle size, Distribution, Measuring instruments, Test methods, Calibration.

The general description of the 90 degrees scattering measurements of raindrop size distribution, as implemented in the AFCRL Airborne Raindrop Spectrometer, is given. The calibration procedures for the drop generator show long-time stability of the order of 01 mm drop diameter. The techniques for calibrating the spectrometer are described with the information required for data reduction. Calibration data for the simple current-to-voltage transducer and for a signal processor which removes the background illumination signal and stretches the drop pulse are presented. (Author)

AD-780 652/4GA PC$3.25/MF$1.45
Rand Corp Santa Monica Calif
SOME PREDICTED CLIMATIC EFFECTS OF A SIMULATED SAHARA LAKE,
R. R. Rapp, and M. Warshaw. Mar 74, 39p Rept no. R-1415-ARPA
Contract DAHC15-73-C-0181, ARPA Order-189-1

Descriptors: *Climate, *Saharan Africa, *Computerized simulation, Lakes, Atmospheric circulation, Atmospheric precipitation.
Identifiers: *Climatic changes.

Results of simulating the addition of a large body of water to the Sahara Desert using the Rand version of the Mintz-Arakawa general circulation model. The simulated lake is a relatively small perturbation to the earth's boundary condition and was chosen to test the hypothesis that an observable and statistically significant change would be produced in the local circulation. The flux and flux divergence of water vapor over North Africa was studied to determine where the water added to the atmosphere by the lake would be precipitated. A significant change in precipitation was subsequently observed over the selected area. A new statistical measure is described and used to measure the significance of the observed change. (Author)

AD-780 662/3GA PC$9.75/MF$1.45
National Climatic Center Asheville N C
U. S. NAVAL WEATHER SERVICE COMMAND SUMMARY OF SYNOPTIC METEOROLOGICAL OBSERVATIONS: EAST AFRICAN AND SELECTED ISLAND COASTAL MARINE AREAS. VOLUME 2. AREA 7 - RED SEA SOUTH, AREA 8 - RED SEA SOUTH CENTRAL, AREA 9 - RED SEA CENTRAL, AREA 11 RED SEA NORTH CENTRAL, AREA 11 - RED SEA NORTH, AREA 12 - GULF OF SUEZ.
Jun 74, 482p
See also Volume 1, AD-780 313, and Volume 3, AD-780 314.

Descriptors: *Marine meteorology, *Coastal regions, *Red Sea, Meteorological phenomena, Air water interactions, Climate, Atmospheric precipitation, Atmospheric temperature, Visibility, Cloud cover, Fog, Ocean waves, Gulfs, Tables(Data).
Identifiers: *Suez Gulf,

The data contained in these tables were obtained from tape data Family 11 (TDF-11), Marine Surface observations. TDF-11 was primarily funded by the Naval Weather Service Command and selected by NWSED Asheville as the most comprehensive collection of marine surface observations from which to develop a series of coastal marine summaries.

AD-780 667/2GA PC$10.75/MF$1.45
National Climatic Center Asheville N C
U. S. NAVAL WEATHER SERVICE COMMAND SUMMARY OF SYNOPTIC METEOROLOGICAL OBSERVATIONS: EAST AFRICAN AND SELECTED ISLAND COASTAL MARINE AREAS. VOLUME 4. AREA 19 - KENYA COAST, AREA 20 - ZANZIBAR, AREA 21 - TANZANIA COAST S E, AREA 22 - PORTO AMELIA, AREA 23 - LUMBO, AREA 24 - MOZAMBIQUE CHANNEL N W., AREA 25 - MOZAMBIQUE CHANNEL S. W.
Jun 74, 561p
See also Volume 3, AD-780 314, and Volume 5, AD-780 670.

Descriptors: *Marine meteorology, *Coastal regions, *Kenya, *Tanzania, *Mozambique, Meteorological phenomena, Air water interactions, Climate, Atmospheric precipitation, Atmospheric temperature, Visibility, Cloud cover, Fog, Ocean waves, Tables(Data).
Identifiers: Zanzibar(Tanzania), Porto Amelia(Mozambique), Lumbo(Mozambique), Mozambique channel.

The data contained in these tables were obtained from tape data Family 11 (TDF-11), Marine Surface observations. TDF-11 was primarily funded by the Naval Weather Service Command and selected by NWSED Asheville as the most comprehensive collection of marine surface observations from which to develop a series of coastal marine summaries.

AD-780 670/6GA PC$10.75/MF$1.45
National Climatic Center Asheville N C
U.S. NAVAL WEATHER SERVICE COMMAND SUMMARY OF SYNOPTIC METEOROLOGICAL OBSERVATIONS: EAST AFRICAN AND SELECTED ISLAND COASTAL MARINE AREAS. VOLUME 5. AREA 26 - LOURENCO MARQUES, AREA 27 - TULEAR, AREA 28 - MOZAMBIQUE CHANNEL SE, AREA 29 - MOZAMBIQUE CHANNEL NE, AREA 30 - DIEGO GARCIA, AREA 31 - GAN, AREA 32 - MINICOY ISLAND.
Jun 74, 561p
See also Volume 4, AD-780 667.

Descriptors: *Marine meteorology, *Coastal regions, *Mozambique, *Maldive Islands, *Madagascar, Meteorological phenomena, Air water interactions, Climate, Atmospheric precipitation, Atmospheric temperature, Visibility, Cloud cover, Ocean waves, Fog, Tables(Data).
Identifiers: Lourenco Marques(Mozambique), Tulear(Madagascar), Mozambique Channel, Diego Garcia Island, Gan Island, Minicoy Island.

The data contained in these tables were obtained from tape data Family 11 (TDF-11), Marine Surface observations. TDF-11 was primarily funded by the Naval Weather Service Command and selected by NWSED Asheville as the most comprehensive collection of marine surface observations from which to develop a series of coastal marine summaries.

AD-780 676/3GA PC$3.25/MF$1.45
Rand Corp Santa Monica Calif
SUPPLEMENTAL GLOBAL CLIMATIC DATA: JANUARY,
C. Schutz, and W. L. Gates. Dec 73, 42p Rept no. R-915/2-ARPA
Contract DAHC15-73-C-0181, ARPA Order-189-1
See also AD-744 633.

Descriptors: *Climate, Periodic variations, Marine meteorology, Surface temperature, Cloud cover, Albedo, Solar radiation, Tables(Data), Ocean surface.

The supplemental global distributions of sea-surface temperature, total cloud cover, planetary albedo, and outgoing long-wave radiation for January are presented as an update to all January data previously published (R-915, R-915/1). All data are presented on a global grid of four degree latitude and five degree longitude, both in the form of tabulated values and machine-analyzed maps. The corresponding zonal and global averages are also given. These data are being used at Rand as a guide for evaluating climate simulations based on the Rand version of the Mintz-Arakawa general circulation model.

AD-780 677/1GA PC$3.25/MF$1.45
Rand Corp Santa Monica Calif
SUPPLEMENTAL GLOBAL CLIMATIC DATA: JULY,
C. Schutz, and W. L. Gates. Mar 74, 42p Rept no. R-1029/1-ARPA
Contract DAHC15-73-C-0181, ARPA Order-189-1
See also AD-760 283.

Descriptors: *Climate, Periodic variations, Marine meteorology, Surface temperature, Cloud cover, Albedo, Solar radiation, Tables(Data), Ocean surface.

In the supplement to R-1029, the hemispheric distributions of sea-surface temperature, total cloud cover, planetary albedo, and outgoing longwave radiation for July are extended from hemispheric to global scope. All data are presented on a global grid of four degrees latitude and five degrees longitude. They are given both in tabulations and in the form of machine-drawn maps. The corresponding zonal and global averages are also given. These data are being used as a guide for evaluating climate simulations based on the Rand version of the Mintz-Arakawa general circulation model.

AD-780 679/7GA PC$3.00/MF$1.45
Rand Corp Santa Monica Calif
THE ATMOSPHERIC RESPONSE TO A STRATOSPHERIC DUST CLOUD AS SIMULATED BY A GENERAL CIRCULATION MODEL,
E. S. Batten. Mar 74, 23p Rept no. R-1324-ARPA
Contract DAHC15-73-C-0181, ARPA Order-189-1

Descriptors: *Atmospheric circulation, *Dust, *Stratosphere, Computerized simulation, Climate, Solar radiation, Attenuation, Atmospheric precipitation.
Identifiers: *Climatic changes, Greenhouse effect.

Results of using the Rand version of the Mintz-Arakawa general circulation model to investigate the initial atmospheric response to a stratospheric dust cloud spread uniformly in a zone between twenty-five degrees north and seventy-five degrees north. The dust particles, construed to be two microns or less in diameter, have a total volume comparable to the ejecta of Krakatoa in 1883. The model was integrated for a simulated period corresponding to January and February, the results being compared with those of a control run starting with the same initial conditions and simulating the same period. The temperature below the dust cloud cooled two to three degrees and the land/ocean temperature contrasts increased. Precipitation varied as a result of changes in the circulation and moisture flux. Midlatitude Ferrel circulations were weakened; baroclinicity decreased at high latitudes and increased at low. (Author)

AD-780 680/5GA PC$5.50/MF$1.45
Rand Corp Santa Monica Calif
GLOBAL CLIMATIC DATA FOR SURFACE, 800 MB, 400 MB: APRIL,
C. Schutz, and W. L. Gates. Dec 73, 197p Rept no. R-1317-ARPA
Contract DAHC15-73-C-0181, ARPA Order-189-1
See also AD-780 685.

Descriptors: *Climate, Seasonal variations, Barometric pressure, Surface temperature, Wind, Moisture, Cloud cover, Albedo, Evaporation, Solar radiation, Atmosphere models, Ocean surface, Atmospheric temperature, Atmospheric precipitation, Tables(Data).

The April global distributions of pressure, temperature, wind, and moisture have been taken from a variety of climatological sources and formats, for reconstruction at the surface, 800 mb, and 400 mb to facilitate comparison with integrations from the Mintz-Arakawa two-level model. These data are supplemented by presentations of the global distributions of cloudiness, planetary and surface albedo, long-wave radiation, evaporation, precipitation, and selected elements of the surface heat balance. All data are presented on a global grid of 4 degrees latitude by 5 degrees longitude, in the form of both tabulated values and machine-analyzed maps. The corresponding zonal and global averages are also given. (Modified author abstract)

AD-780 685/4GA PC$5.50/MF$1.45
Rand Corp Santa Monica Calif
GLOBAL CLIMATIC DATA FOR SURFACE, 800 MB, 400 MB: OCTOBER,
C. Schutz, and W. L. Gates. Mar 74, 197p Rept no. R-1425-ARPA
Grant DAHC15-73-C-0181, ARPA Order-189-1
See also AD-780 680.

Descriptors: *Climate, Seasonal variations, Barometric pressure, Surface temperature, Wind, Moisture, Cloud cover, Albedo, Solar radiation, Evaporation, Atmosphere models, Ocean surface, Atmospheric temperature, Atmospheric precipitation, Tables(Data).

Fourth in a series of seasonal climatic summaries, this report presents data on the primary climatic variables for the month of October. The global distributions of pressure, temperature, wind, and moisture were taken from a variety of climatological sources and formats, and reworked to show conditions at the surface, at 800 mb, and 400 mb. Also presented are the global distributions of cloudiness, planetary and surface albedo, long-wave radiation, evaporation, precipitation, and selected elements of the surface heat balance. Information is presented on a global grid of 4 deg latitude by 5 deg longitude, in the form of tables and machine-produced maps. Corresponding zonal and global averages are given. (Modified author abstract)

AD-780 696/1GA PC$3.75/MF$1.45
Cold Regions Research and Engineering Lab Hanover N H
AIR MASSES, FRONTS AND WINTER PRECIPITATION IN CENTRAL ALASKA.
Master's thesis,
Michael A. Bilello. Jun 74, 58p Rept no. CRREL-RR-319

Descriptors: *Air mass analysis, *Atmospheric precipitation, *Alaska, Winter, Atmospheric temperature, Barometric pressure, Visibility, Snow, Rain, Ice fog, Theses.
Identifiers: *Fronts(Meteorology).

The physical, meteorological and climatological aspects of freezing precipitation in the Tanana River Basin of central Alaska are examined. Periods of inclement weather are evaluated with respect to frequency and duration, and concurrent temperature, wind, atmospheric pressure and visibility conditions. Although relatively dry polar continental air masses dominate the area in winter, massive intrusions of maritime air occasionally produce a major snowstorm and, in rare instances, rain or freezing rain. Because of the surrounding mountain ranges, snow occurs most often when the atmospheric pressure is rising and the winds are from the west. Ice fogs are observed at temperatures below -21F, and very few water-droplet fogs are reported at temperatures below -31F. The relationships between air masses, fronts and local climatic influences may be used in forecasting winter precipitation in central Alaska. The statistical survey presented also contributes new information on winter weather conditions in this region. (Author)

AD-780 723/3GA PC$3.75/MF$1.45
Army Missile Command Redstone Arsenal Ala Physical Sciences Directorate
ON SPATIAL DISTRIBUTION OF VISIBILITY AND CLOUDS IN CENTRAL EUROPE.
Technical rept.,
Oskar M. Essenwanger. 28 Dec 73, 64p Rept no. RR-73-10

Descriptors: *Cloud cover, *Visibility, Ceiling, Probability, Fog, Spatial distribution, Patterns, Correlation techniques, Tables(Data), Weather.
Identifiers: *Central Curope.

Adverse weather conditions as defined by joint occurrence of low visibility and low ceiling have been investigated for area of Central Europe. The thresholds of adverse conditions are defined in detail in this report. The ultimate goal was the assessment of probabilities for the occurrence of adverse weather in Central Europe. Details of contingency tables for visibility versus ceiling for 14 individual stations in Central Europe up to the joint probabilities of six stations are tabulated and discussed. (Modified author abstract)

AD-780 745/6GA PC$3.25/MF$1.45
Army Land Warfare Lab Aberdeen Proving Ground Md
EVALUATION OF THE USALWL (U.S. ARMY LAND WARFARE LABORATORY) WEATHER KIT.
Final rept.,
M. J. Wargovich. May 74, 44p Rept no. LWL-TR-74-80

Descriptors: *Kits, *Meteorological instruments, Measurement, Thermometers, Barometers, Wind direction indicators, Compasses, Reliability, Field equipment.
Identifiers: Weather kits.

A small, compact, lightweight weather kit that can be carried on an individual's belt was developed. The kit can be used by untrained personnel after brief familiarization with the operating instructions. Kits were evaluated for field use. The components of the weather kit are the following: Sling psychrometer to measure relative humidity; Thermometer; Barometer/altimeter; Compass; Wind direction indicator; Wind speed meter; Rain gauge, and Water vial.

AD-780 760/5GA PC$3.00/MF$1.45
Army Electronics Command White Sands Missile Range N Mex Atmospheric Sciences Lab
16301 LITTLE JOHN, MISSILE NO. 3191, ROUND NO. 709 RM (18 APRIL 1974).
Meteorological data rept.
Apr 74, 15p Rept no. DR-830

Descriptors: *Meteorological data, *Upper atmosphere, *Impact prediction, Artillery rockets, Guided missile ranges, Exterior ballistics, Atmospheric temperature, Barometric pressure, Wind, Humidity, Density, Cloud cover, Tables(Data), New Mexico.
Identifiers: Little John.

Meteorological data gathered for the launching of 16301 Little John, Missile Number 3191, Round Number 709 RM, are presented in tabular form. (Author)

AD-780 761/3GA PC$3.25/MF$1.45
Army Electronics Command White Sands Missile Range N Mex Atmospheric Sciences Lab
14801/07 LANCE, MISSILE NOS. 2565/2566, ROUND NOS. 217 APT/218 APT (18 APRIL 1974).
Meteorological data rept.
Apr 74, 41p Rept no. DR-831

Descriptors: *Meteorological data, *Upper atmosphere, *Sounding rockets, *Impact prediction, Guided missile ranges, Atmospheric temperature, Barometric pressure, Wind, Exterior ballistics, Cloud cover, Humidity, Density, Tables(Data), New Mexico.
Identifiers: Lance missiles, Missile modification.

Meteorological data gathered for the launching of 14801/07 Lance, Missile Numbers 2565/2566, Round Numbers 217 APT/218 APT, are presented in tabular form. (Author)

AD-780 762/1GA PC$3.00/MF$1.45
Army Electronics Command White Sands Missile Range N Mex Atmospheric Sciences Lab
11608 LANCE, MISSILE NO. 5132, ROUND NO. 219 RTT (23 APRIL 74).
Meteorological data rept.
Apr 74, 24p Rept no. DR-832

Descriptors: *Meteorological data, *Upper atmosphere, *Sounding rockets, *Impact prediction, Guided missile ranges, Atmospheric temperature, Barometric pressure, Wind, Humidity, Exterior ballistics, Cloud cover, Density, Tables(Data), New Mexico.
Identifiers: Lance missiles, Missile modification.

Meteorological data gathered for the launching of 11608 Lance, Missile Number 5132, Round Number 219 RTT, are presented in tabular form. (Author)

AD-780 763/9GA PC$3.25/MF$1.45
Army Electronics Command White Sands Missile Range N Mex Atmospheric Sciences Lab
14801 LANCE, MISSILE NO. 2196, ROUND NO. 220 APT (25 APRIL 1974).
Meteorological data rept.
Apr 74, 38p Rept no. DR-833

Descriptors: *Meteorological data, *Upper atmosphere, *Sounding rockets, *Impact prediction, Guided missile ranges, Atmospheric temperature, Barometric pressure, Wind, Humidity, Exterior ballistics, Cloud cover, Density, Tables(Data), New Mexico.
Identifiers: Lance missiles, Missile modification.

Meteorological data gathered for the launching of 14801 Lance, Missile Number 2196, Round Number 220 APT, are presented in tabular form. (Author)

AD-780 764/7GA PC$3.00/MF$1.45
Army Electronics Command White Sands Missile Range N Mex Atmospheric Sciences Lab
15001 LITTLE JOHN MISSILE NO. 1910, ROUND NO. 710 RG (30 APRIL 1974).
Meteorological data rept.
Apr 74, 15p Rept no. DR-835

Descriptors: *Meteorological data, *Upper atmosphere, *Impact prediction, Artillery rockets, Guided missile ranges, Exterior ballistics, Atmospheric temperature, Barometric pressure, Humidity, Wind, Density, Cloud cover, Tables(Data), New Mexico.
Identifiers: Little John.

Meteorological data gathered for the launching of 15001 Little John, Missile Number 1910, Round Number 710 RG, are presented in tabular form. (Author)

AD-780 766/2GA PC$3.25/MF$1.45
Army Electronics Command White Sands Missile Range N Mex Atmospheric Sciences Lab
12809 LANCE, MISSILE NO. 2134, ROUND NO. 222 SCT (2 MAY 1974).
Meteorological data rept.
May 74, 36p Rept no. DR-836

Descriptors: *Meteorological data, *Upper atmosphere, *Sounding rockets, *Impact prediction, Guided missile ranges, Atmospheric temperature, Barometric pressure, Wind, Exterior ballistics, Humidity, Cloud cover, Density, Tables(Data), New Mexico.
Identifiers: Lance missiles, Missile modification.

Meteorological data gathered for the launching of 12809 Lance, Missile Number 2134, Round Number 222 SCT, are presented in tabular form. (Author)

AD-780 767/0GA PC$3.00/MF$1.45
Army Electronics Command White Sands Missile Range N Mex Atmospheric Sciences Lab
15001 LITTLE JOHN, MISSILE NO. 1912, ROUND NO. 711 RS (3 MAY 1974).
Meteorological data rept.
May 74, 15p Rept no. DR-837

Descriptors: *Meteorological data, *Upper atmosphere, *Impact prediction, Artillery rockets, Guided missile ranges, Exterior ballistics, Atmospheric temperature, Barometric pressure, Humidity, Wind, Density, Cloud cover, Tables(Data), New Mexico.
Identifiers: Little John.

Meteorological data gathered for the launching of 15001 Little John, Missile Number 1912, Round Number 711 RS, are presented in tabular form. (Author)

AD-780 768/8GA PC$3.75/MF$1.45
Army Electronics Command White Sands Missile Range N Mex Atmospheric Sciences Lab
11602 LANCE, MISSILE NO. 2732, ROUND NO. 223 RST (7 MAY 1974).
Meteorological data rept.
May 74, 53p Rept no. DR-838

Descriptors: *Meteorological data, *Upper atmosphere, *Sounding rockets, *Impact prediction, Guided missile ranges, Atmospheric temperature, Barometric pressure, Wind, Exterior ballistics, Humidity, Cloud cover, Density, Tables(Data), New Mexico.
Identifiers: Lance missiles, Missile modification.

Meteorological data gathered for the launching of 11602 Lance, Missile Number 2732, Round Number 223 RST, are presented in tabular form. (Author)

AD-780 769/6GA PC$3.75/MF$1.45
Army Electronics Command White Sands Missile Range N Mex Atmospheric Sciences Lab
12813 LANCE, MISSILE NO. 2246, ROUND NO. 224 SCT (9 MAY 1974).
Meteorological data rept.
May 74, 53p Rept no. DR-839

Descriptors: *Meteorological data, *Upper atmosphere, *Sounding rockets, *Impact prediction, Guided missile ranges, Atmospheric temperature, Barometric pressure, Wind, Humidity, Exterior ballistics, Cloud cover, Density, Tables(Data), New Mexico.
Identifiers: Lance missiles, Missile modification.

Meteorological data gathered for the launching of 12813 Lance, Missile Number 2246, Round Number 224 SCT, are presented in tabular form. (Author)

AD-780 770/4GA PC$3.75/MF$1.45
Army Electronics Command White Sands Missile Range N Mex Atmospheric Sciences Lab
12813 LANCE, MISSILE NO. 2243, ROUND NO. 225 SCT (15 MAY 1974).
Meteorological data rept.
May 74, 56p Rept no. DR-840

Descriptors: *Meteorological data, *Upper atmosphere, *Sounding rockets, *Impact prediction, Guided missile ranges, Atmospheric temperature, Barometric pressure, Wind, Humidity, Exterior ballistics, Cloud cover, Density, Tables(Data), New Mexico.
Identifiers: Lance missiles, Missile modification.

Meteorological data gathered for the launching of 12813 Lance, Missile Number 2243, Round Number 225 SCT, are presented in tabular form. (Author)

AD-780 771/2GA PC$3.00/MF$1.45
Army Electronics Command White Sands Missile Range N Mex Atmospheric Sciences Lab
16201 LITTLE JOHN MISSILE NO. 3193, ROUND NO. 719 RM (20 MAY 1974).
Meteorological data rept.
May 74, 13p Rept no. DR-841

Descriptors: *Meteorological data, *Upper atmosphere, *Impact prediction, Artillery rockets, Guided missile ranges, Atmospheric temperature, Barometric pressure, Humidity, Wind, Density, Exterior ballistics, Cloud cover, Tables(Data), New Mexico.
Identifiers: Little John.

Meteorological data gathered for the launching of 16201 Little John, Missile Number 3193, Round Number 719 RM, are presented in tabular form. (Author)

AD-780 772/0GA PC$5.00/MF$1.45
Control Data Corp Minneapolis Minn Research Div
OBJECTIVE METHODS FOR LOCATING THE CENTER OF TROPICAL STORMS.
Technical rept.,
D. G. Dartt, M. S. Ulstad, and R. A. Weinberg. 25 Feb 74, 37p Rept no. TR-1 EPRF-TR-4-74(CDC)
Contract N66856-3029-5500

Descriptors: *Storms, *Tropical regions, Power spectra, Curvature, Patterns, Clouds, Brightness, Computerized simulation, Meteorological satellites, Mathematical analysis.
Identifiers: Spaceborne photography.

Objective techniques have been developed to aid the meteorological analyst in depicting the concentric structure of tropical storms from digital satellite brightness data. The first technique consists of a linear filter which is designed to enhance concentric brightness patterns while suppressing large scale background features. A second algorithm was developed for finding the probable center of curvature among concentric brightness elements. The programs have been tested for cloud patterns from one tropical storm in various stages of development as well as for several other common patterns of actual and simulated cloud brightness. The results show that (1) enhancement of a tropical storm with a concentric filter can delineate the major concentric features of the brightness pattern, (2) a realistic center of curvature can be computed from elements of the concentric brightness pattern, and (3) the method can detect weak concentricity that may go undetected by a human analyst. (Author)

AD-780 871/0GA Reprint
Air Force Cambridge Research Labs L G Hanscom Field Mass
SOME ASPECTS OF THE STRUCTURE OF CONVECTIVE PLANETARY BOUNDARY LAYERS,
J. C. Wyngaard, S. P. S. Arya, and O. R. Cote. 5 Dec 73, 10p Rept no. AFCRL-TR-74-0262
Revision of report dated 1 Oct 73.
Availability: Pub. in Jnl. of Atmospheric Sciences, v31 n3 p747-754 Apr 74.

Descriptors: *Atmospheric motion, *Turbulent boundary layer, Equations of motion, Coriolis effect, Wind shear, Heat transfer.
Identifiers: *Planetary boundary layer, Geostrophic wind.

It is shown that although Coriolis forces cause large production rates of stress in a convective planetary boundary layer, there is a control mechanism involving mean wind shear which prevents stress levels from becoming large. Higher-order-closure model calculations are presented which show that the stress profiles are essentially linear, regardless of wind direction, oviding the geostrophic wind shear vanishes and the wind speed jump across the capping inversion is negligible. It is shown that it will be very difficult to verify these predicted stress profiles experimentally because of averaging time problems. A simple two-layer model is developed which leads to geostrophic drag and heat transfer expressions in fairly good agreement with Wangara data. (Author)

AD-780 900/7GA PC$3.25/MF$1.45
Scripps Institution of Oceanography La Jolla Calif Advanced Ocean Engineering Lab
ATMOSPHERIC BOUNDARY LAYER MEASUREMENTS FROM AN OCEANIC RESEARCH TOWER.
Final rept. 1 Apr 72-31 Dec 73,
J. T. Park, and C. W. Van Atta. Dec 73, 31p Rept nos. AOEL-57, SIO-Ref-74-9
Contract N00014-69-A-0200-6039

Descriptors: *Atmospheric motion, *Atmospheric temperature, Turbulence, Boundary layer, Detectors, Power spectra, Numerical analysis, Air water interactions, Marine meteorology.
Identifiers: *Atmospheric boundary layer.

Preliminary fine-scale measurements of temperature, velocity, and their derivatives in the atmosphere have been completed on a U.S. Navy oceanographic research tower. The spectra and probability density functions are similar to those of previous investigators. Special techniques have been developed for the calibration of velocity and temperature in the field.

AD-780 913/0GA PC$3.25/MF$1.45
Texas A and M Univ College Station Dept of Oceanography and Meteorology
PREDICTION OF ENVIRONMENTAL PARAMETERS.
Final rept.,
William H. Clayton. May 74, 50p Rept no. A/M-Ref-74-2-F ECOM-0073-F-68
Contract DAAB07-68-C-0073
See also AD-751 744.

Descriptors: *Atmospheric motion, *Weather forecasting, *Cumulus clouds, Air water interactions, Turbulent flow, Reynolds number, Atmosphere models, Meteorological radar, Eddy currents, Rainfall, Tropical regions.
Identifiers: Themis project.

Project Themis, scheduled to terminate in September 1972, was granted an extension without additional funding through September 1973, in order to permit orderly termination of on-going research and particularly so for graduate student efforts involving theses and dissertation preparations. Inasmuch as these research efforts have all been reported in separate technical reports, the scope of this final report on Project Themis will be limited to a brief summary of the major research tasks pursued and previously reported, as well as some additional activities conducted during the final year. (Author)

AD-780 920/5GA PC$4.00/MF$1.45
Florida State Univ Tallahassee Dept of Meteorology
A MULTIPLE--SCALE RESEARCH PROGRAM IN TROPICAL METEOROLOGY.
Quarterly progress rept. no. 9, 1 Jul-31 Oct 71,
N. E. La Seur, M. Garstang, J. Levine, and J. Lee. Dec 71, 85p ECOM-0062-9-69
Contract DAAB07-69-C-0062
See also Quarterly progress rept. no. 10, AD-780 566.

Descriptors: *Meteorological data, *Barbados, *Tropical regions, Wind, Circulation, Troposphere, Clouds, Patterns, Meteorological balloons, Radar tracking, Spectrum analysis, Boundary layer, Fourier transformation.

During the 1969 Barbados Field Program a constant level balloon was entrained into a cumulus congestus cloud. Radar observations, cloud photos and satellite pictures furnished patterns of local island cloud array and synoptic-scale cloud field. Balloon's vertical velocity profile is compared to that derived from a steady state jet model of a cumulus cloud. Using Fourier considerations, wind data derived from constant density balloon flights over Barbados are used to examine small scale motions in the boundary layer. Diurnal shifts between small mechanical and larger thermal scales are tentatively indicated. (Author)

AD-781 010/4GA PC$3.25/MF$1.45
Fraunhofer-Gesellschaft Garmisch-Partenkirchen (West Germany)
BOUNDARY LAYER AEROSOL TRANSPORT MEASUREMENTS IN A VALLEY SYSTEM.
Final technical rept.,
Reinhold Reiter. Jan 74, 35p
Contract DAJA37-73-C-1806

Descriptors: *Atmospheric motion, *Aerosols, Boundary layer, Aerosol generators, Fluorescence, Ultraviolet radiation, Samplers, West Germany, Mountains.
Identifiers: Valleys, Atmospheric boundary layer.

Preparations were made for the performance of a field experiment concerning the dispersion of fluorescent test aerosol particles within a mountain valley. Essentially they included the construction of 20 rotorod samplers and of 100 H-shaped vanes therefore. The samplers were improved by a new electronic circuit to ensure constant speed of the vanes even if battery voltage drops. A microscopical bench was installed for the counting of fluorescent particles in UV light. The aerosol generator was checked and test-run. The procedure for exact determination of air currents in the valley experiment using pilot balloons was further developed and respective computer programs set up. Preparatory work was done for installation of the aerosol generator on top of an isolated hill within the valley. (Author)

AD-781 037/7GA PC$3.25/MF$1.45
Air Force Cambridge Research Labs L G Hanscom Field Mass
PARAMETERIZATION OF CUMULUS CONVECTION FOR INCLUSION IN A TROPICAL OPERATIONAL FORECASTING MODEL.
Environmental research papers,
Louis Berkofsky. 13 Feb 74, 42p Rept nos. AFCRL-ERP-467, AFCRL-TR-74-0089

Descriptors: *Atmospheric motion, *Cumulus clouds, *Convection(Atmospheric), Tropical regions, Weather forecasting, Partial differential equations, Mathematical models.

The equations for large-scale tropical flow, when averaged horizontally over a region large enough to contain an ensemble of clouds, include terms which represent the vertical convergence of the vertical eddy transport of sensible heat and of moisture. By assuming that these convergences are related to cumulus convection, the effect of an assumed population of cumulus clouds may be introduced into the large-scale model. The magnitude of the cumulus cloud effects must then be obtained from a cloud model, using predicted environmental parameters as input. In this investigation, the clouds are represented by a steady state plume model. Preliminary results, using assumed environmental parameters, are presented. (Author)

AD-781 052/6GA PC$5.00/MF$1.45
Weather Squadron (12th) Ent AFB Colo
MAP TYPE CATALOG FOR THE FLORIDA WINDOW,
Robert C. Sabin, Richard L. Nieman, and Hal W. Wold. Jun 74, 168p Rept no. 12WS-TP-74-6

Descriptors: *Meteorological charts, *Weather forecasting, *Florida, Catalogs, Climate, Barometric pressure, Statistical data.
Identifiers: Synoptic meteorology.

A standardized procedure has been developed to determine the synoptic map types which have occurred over a specified area (window). The map type catalog is a summarization of information relating to these map types for the Florida window. (There is a catalog for each of the 14 windows which cover the United States). The catalog includes characteristics of the map types and listings of each map in the data base (25 years of surface pressure maps) along with its most similar map type. (Author)

AD-781 053/4GA PC$3.25/MF$1.45
Weather Wing (6th) Eglin AFB Fla Detachment 10
VERIFICATION OF RAINFALL ESTIMATES: AN ANALYSIS OF ACTIVATION PATTERNS OF ADSID AND ACOUSID SEISMIC AND ACOUSTIC INTRUSION SENSORS TO DETERMINE RAINFALL RATES.
Final rept.,
Donald H. Kampwerth, and Richard A. Rasmussen. Feb 74, 41p AWS-TR-74-253

Descriptors: *Rainfall, Estimates, Acoustic detectors, Correlation techniques, Meteorological instruments.

A test was conducted at Eglin AFB, Florida in the Fall of 1972 to verify rainfall rates as determined from the activation patterns of seismic and acoustic intrusion sensors. Sensor activations were recorded, analyzed, and compared with rainfall rates as determined from recording rain gauges collocated with the sensor strings. Useful comparison data were obtained on nine tests, as definite sensor activation patterns were correlated with various rainfall rates. Scatter diagrams were prepared and analyzed to summarize the sensor activation/rainfall rate comparison. (Author)

AD-781 154/0GA PC$4.00/MF$1.45
Army Foreign Science and Technology Center Charlottesville Va
CHARACTERISTICS OF THE INTENSITY OF ATMOSPHERIC PRECIPITATION OVER EURASIA AND NORTH AFRICA,
O. G. Sorochan. 30 Jan 74, 15p Rept no. FSTC-HT-23-195-73
Trans. from Glaynaya Geofizicheskaya Observatoriya, Leningrad. Trudy (USSR) v266 1970.

Descriptors: *Atmospheric precipitation, *Europe, *Asia, *North Africa, Intensity, Probability, Seasonal variations, Monsoons, Translations, USSR.

The article discusses the intensity of preciptiation over Eurasia and North Africa. The intensity of precipitation over a large section of Eurasia is low from January to July. In Jul; the intensity increases especially in regions with prevalent summer monsoon circulation. Intensity increases in July because of an increased quantity of precipitation and also because of the brief time in which it falls. The maps included are schematic, as they are obtained for vast regions from data at only a small number of meteorological stations. (Author)

COM-74-11149/3GA PC$3.25/MF$1.45
National Weather Service, Fort Worth, Tex. Southern Region.
THE NATIONAL WEATHER SERVICE MANUALLY DIGITIZED RADAR PROGRAM AND SOME APPLICATIONS.
Technical memo.,
P. L. Moore, A. D. Cummings, and D. L. Smith.
Apr 74, 26p NOAA-TM-NWS-SR-75 NOAA-74052002

Descriptors: *Weather forecasting, *Meteorological radar, *Pattern recognition, Precipitation(Meteorology), Flood forecasting.

The manually digitized radar (MDR) program grew out of work in the NWS Southern Region aimed at improving probability of precipitation (PoP) forecasts. The MDR data have proved useful in a wide variety of other applications. These include weather-watch and diagnostic procedures, aviation briefing, quality control of radar data, forecast verification, and hydrologic uses. The data are now being archived on magnetic tape and will encourage further applications such as improved initial-moisture analysis of numerical models and forecast techniques based on a synoptic climatology of radar echoes. Statement are included on the application of pattern recognition techniques; on digital radar data as a predictor of flash flood potential; on limitations of MDR data, and on hydrologic applications. A nomogram for estimating rainfall amounts from MDR totals is presented.

JPRS-62197 PC$3.00/MF$1.45
Joint Publications Research Service, Arlington, Va.
SOLAR CORPUSCULAR STREAMS AND WEATHER ON THE EARTH,
N. S. Sidorenkov. 7 Jun 74, 23p

*Atmospheric circulation, *Solar radiation, Weather, Correlations, Translations, USSR.

The report contains an examination of the effect of corpuscular streams on atmospheric circulation and weather on the earth.

N74-22115/1GA PC$6.00/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
A MULTI-SENSOR ANALYSIS OF NIMBUS 5 DATA ON 22 JANUARY 1973.
L. J. Allison, E. B. Rodgers, T. T. Wilheit, and R. Wexler. Jan 73, 58p NASA-TM-X-70633, X-910-74-20

Descriptors: *Infrared instruments, *Meteorological parameters, *Nimbus 5 satellite, *Radiometers, Ground water, Gulf of mexico, Humidity, Soils, Temperature.

For abstract, see STAR 1213

N74-22267/0GA PC$17.25/MF$1.45
Wisconsin Univ., Madison. Space Science and Engineering Center.
MULTIDISCIPLINARY STUDIES OF THE SOCIAL, ECONOMIC AND POLITICAL IMPACT RESULTING FROM RECENT ADVANCES IN SATELLITE METEOROLOGY, VOLUME 5.
Interim Report.
Nov 73, 283p NASA-CR-138155
Contract NGL-50-002-114

Descriptors: *Information dissemination, *Mesometeorology, *Weather forecasting, Agriculture, Broadcasting, Costs, Meteorological parameters, Wisconsin.

For abstract, see STAR 1213

N74-22275/3GA PC$4.75/MF$1.45
Finnish Meteorological Inst., Helsinki.
LOCATING THUNDERSTORMS BY SPHERICS OBSERVATIONS MYRSKYKESKUSTEN PAIKALLISTAMINEN SFERICS-HAVAINTOJEN AVULLA.
R. Pirjola. 1973, 32p REPT-47
In Finnish; English Summary.

Descriptors: *Spherical waves, *Thunderstorms, Accuracy, Finland, Frequency measurement, Weather stations.

For abstract, see STAR 1213

N74-22276/1GA PC$6.25/MF$1.45
Finnish Meteorological Inst., Helsinki.
DIURNAL VARIATIONS IN TEMPERATURE AND WHAT AFFECTS THEM LAEMPOETILAN VUOROKAUSIVAIHTELUSTA JA SIIHEN VAIKUTTAVISTA TEKIJOEISTAE.
R. Heino. 1973, 61p REPT-46
In Finnish; English Summary.

Descriptors: *Atmospheric temperature, *Diurnal variations, *Finland, Annual variations, Cloud cover, Snow, Surface properties, Wind (Meteorology).

For abstract, see STAR 1213

N74-22277/9GA PC$16.00/MF$1.45
Schweizerische Meteorologische Zentralanstalt, Zurich.
ANNALS OF THE CENTRAL METEOROLOGICAL INSTITUTE OF SWITZERLAND, 108TH ISSUE, 1971 ANNALEN DER SCHWEIZERISCHEN METEOROLOGISCHEN ZENTRALANSTALT, HUNDERTACHTER JAHRGANG 1971.
May 73, 260p
Language in German.

Descriptors: *Climatology, *Meteorological parameters, *Meteorological services, *Switzerland, *Weather stations, Data acquisition, Data processing, Meteorological charts, Statistical analysis.

For abstract, see STAR 1213

N74-22278/7GA PC$12.00/MF$1.45
Schweizerische Meteorologische Zentralanstalt, Zurich.
RESULTS OF DAILY PRECIPITATION MEASUREMENTS AT THE METEOROLOGICAL AND RAIN MEASUREMENT STATIONS OF SWITZERLAND, 1971 ERGEBNISSE DER TAEGLICHEN NIEDERSCHLAGSMESSUNGEN AUF DEN METEOROLOGISCHEN UND REGENMESS-STATIONEN DER SCHWEIZ, 1971.
Jul 72, 178p
Language in German.

Descriptors: *Rain, *Switzerland, *Tables (Data), Hydrometeorology, Precipitation (Meteorology), Showers, Weather stations.

For abstract, see STAR 1213

N74-22279/5GA PC$6.25/MF$1.45
Schweizerische Meteorologische Zentralanstalt, Zurich.
CLIMATOLOGY OF SWITZERLAND. BOOK 1, PART 3: WIND KLIMATOLOGIE DER SCHWEIZ: WIND. 1-3 TEIL.
M. Schueepp. 1973, 62p
Language in German.

Descriptors: *Climatology, *Switzerland, *Weather stations, *Wind (Meteorology), *Wind measurement, Data acquisition, Data processing, Meteorological parameters, Statistical analysis.

For abstract, see STAR 1213

N74-22280/3GA PC$4.25
Swiss Inst. of Meteorology, Zurich.
SWISS METEOROLOGICAL BIBLIOGRAPHY BIBLIOGRAPHIE METEOROLOGIQUE SUISSE.
Jul 73, 25p
Language in French.

Descriptors: *Bibliographies, *Switzerland, *Synoptic meteorology, Climatology, Meteorological services, Radiation effects, Weather stations.

For abstract, see STAR 1213

N74-22282/9GA PC$4.00/MF$1.45
Scientific Translation Service, Santa Barbara, Calif.
STUDY OF CLOUDINESS PARAMETERS BASED ON MEASUREMENTS FROM THE KOSMOS-384 SATELLITE.
A. B. Akvilonova, A. Y. Basharinov, A. K. Gorodetskiy, A. S. Gurvich, and M. S. Krylova.
Jul 73, 9p NASA-TT-F-14735
Contract NASW-2483
Tran-Transl. Into English from Izv. Akad. Nauk Sssr, Fiz. Atmos. Okeana (Ussr), Vol. 9, No. 2, 1973 p 187-189.

Descriptors: *Cloud cover, *Cosmos satellites, *Meteorological parameters, Infrared radiation, Microwave frequencies, Pacific ocean, Radiometers.

For abstract, see STAR 1213

N74-22286/0GA PC$3.25/MF$1.45
Northrop Services, Inc., Huntsville, Ala.
STOCHASTIC MODEL OF TEMPORAL CHANGES OF WIND SPECTRA IN THE FREE ATMOSPHERE.
Y. H. Huang. May 74, 50p NASA-CR-129027, M-1259

Contract NAS8-21810

Descriptors: *Earth atmosphere, *Stochastic processes, *Wind profiles, Florida, Statistical distributions, Time functions.

For abstract, see STAR 1213

N74-22288/6GA PC$4.00/MF$1.45
Institut Royal Meteorologique de Belgique, Brussels.
CLIMATOLOGICAL OBSERVATIONSOBSERVATIONS CLIMATOLOGIQUES BULLETIN MENSUEL, JANVIER 1974.
Monthly Bulletin, Jan. 1974.
Jan 74, 15p
In French and Dutch.

Descriptors: *Belgium, *Meteorological parameters, *Tables (Data), Atmospheric moisture, Beta particles, Precipitation (Meteorology), Storms (Meteorology), Sunlight, Wind (Meteorology).

For abstract, see STAR 1213

N74-22289/4GA PC$4.75/MF$1.45
Institut Royal Meteorologique de Belgique, Brussels.
SYNOPTIC OBSERVATIONS OBSERVATIONS SYNOPTIQUES BULLETIN MENSUEL, FEVRIER 1973.
Monthly Bulletin, Feb. 1973.
Feb 73, 31p
In French and Dutch.

Descriptors: *Belgium, *Synoptic meteorology, *Tables (Data), *Weather stations, Periodic variations, Radiosondes.

For abstract, see STAR 1213

N74-22290/2GA PC$4.75/MF$1.45
Institut Royal Meteorologique de Belgique, Brussels.
SYNOPTIC OBSERVATIONS OBSERVATIONS SYNOPTIQUES BULLETIN MENSUEL, MARS 1973.
Monthly Bulletin, Mar. 1973.
Mar 73, 31p
In French and Dutch.

Descriptors: *Belgium, *Synoptic meteorology, *Tables (Data), *Weather stations, Periodic variations, Radiosondes.

For abstract, see STAR 1213

PAT-APPL-399 009 PC$4.00/MF$1.45
Department of the Air Force Washington D C
WEATHER MODIFICATION UTILIZING MICROENCAPSULATED MATERIAL.
Patent Application,
L. D. Nelson. Filed 20 Sep 73, 10p Rept no.
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Cloud seeding, *Weather modification, Encapsulation, Polymers, Ethyl cellulose.
Identifiers: PAT-CL-252-316, *Fog dispersal, *Patent applications.

The patent application describes a fog and cloud seeding agent using microencapsulation techniques whereby controlled seeding particle size for both dry initial particles and particles dispensed as solution droplets provides for the production and maintenance of a predetermined particle spectrum when using hygroscopic chemical compounds which are fragile, brittle or friable in crystalline structure. A hygroscopic chemical agent to be used in cloud or fog seeding is provided with a liquid permeable capsule shell such that optimization of particle size for improved seeding results is obtained.

PB-233 434/0GA PC$5.50/MF$1.45
Portland General Electric Co., Oreg.
CARTY WEST SITE METEOROLOGY.
Rept. for Apr 73-Mar 74.
Jun 74, 183p PGE-2005
Prepared by Meteorology Research, Inc., Altedena, Calif.

Descriptors: *Meteorological data, *Nuclear power plants, *Carty Reservoir, Site surveys, Climate, Precipitation(Meteorology), Atmospheric motion, Solar radiation, Thunderstorms, Ice, Tornadoes, Storms, Wind velocity, Atmospheric temperature, Tables(Data), Oregon.
Identifiers: Thermal pollution.

The purpose of this report is to summarize the local and regional meteorology of the Carty West Site and its environs. Onsite measurements made with an instrumented meteorological tower during the period April 1973 to March 1974 are presented and discussed. Average and extreme values of meteorological parameters are developed and presented. Atmospheric dispersion factors used to assess the safety and environmental impact of a nuclear plant are derived. Models and results are presented on the environmental impact of the use of Carty Reservoir as a source of plant cooling water. The onsite meteorological measurement program is described and the overall quality of the program is quantitatively discussed.

TID-26544 PC$10.25/MF$1.45
Colorado State Univ., Fort Collins (Usa). Dept. Of Atmospheric Science.
SPECTRA OF ATMOSPHERIC MOTIONS IN THE UPPER-TROPOSPHERE AND LOWER-STRATOSPHERE OVER NORTH AMERICA AND AUSTRALIA: EXPERIMENTAL RESULTS AND THEORETICAL CONSIDERATIONS. ATMOSPHERIC SCIENCE PAPER NO. 211.
R. F. Jr. Abbey. Jul 72, 144p

Descriptors: Australia, Earth atmosphere, Motion, North america, Regional analysis, Spectra, Stratosphere, Troposphere, Variations, Wind.

For abstract, see NSA 30 01, number 02268.

UCRL-75556 PC$5.75/MF$1.45
California Univ., Livermore (Usa). Lawrence Livermore Lab.
COMPARISON OF THE SOUTHERN AND NORTHERN HEMISPHERE GENERAL CIRCULATION CHARACTERISTICS AS DETERMINED BY SATELLITE OZONE DATA.
J. E. Lovill. Mar 74, 51p CONF-740106-4

Descriptors: (*Ozone, *Distribution), (*Earth atmosphere, *Seasonal variations), Aircraft, Correlations, Earth planet, Equator, Latitude effect, Levels, Motion, Satellites, Seas, Stratosphere, Velocity, Wind.

For abstract, see NSA 30 01, number 02307.

5. BEHAVIORAL AND SOCIAL SCIENCES

5A. Administration and Management

AD-780 693/8GA PC$4.50/MF$1.45
Defense Systems Management School Fort Belvoir Va
THE CONTRACTING OFFICER AND THE SYSTEM MANAGER: AND ANALYSIS OF AUTHORITIES AND RESPONSIBILITIES WITHIN THE DEPARTMENT OF DEFENSE.
Master's thesis,
Richard Thurmond Mankin. Feb 74, 115p

Descriptors: *Systems engineering, *Department of Defense, *Officer personnel, *Supervisors, Job analysis, Conflict, Contracts, Systems engineering, Factor analysis, Theses.
Identifiers: *Authority, *Responsibility, Contracting officers, Managers.

Is there a conflict between the authorities and responsibilities of the contracting officer and those of the system manager. The author seeks answers to this question by examining the opposing factors between the contracting officer and the system manager, sorting out those which contribute to a healthy program office organization, and identifying the point where collaboration between them should overshadow opposition. The historical evolution of the roles of the contracting officer and the system manager is traced form the Revolutionary War to the present. (Author)

AD-781 024/5GA PC$4.00/MF$1.45
Army Foreign Science and Technology Center Charlottesville Va
CONCERNING THE PATHS OF DEVELOPMENT OF ORGANIZATIONAL THEORIES IN INDUSTRY AND SCIENCE,
G. A. Lakhtin, and V. V. Kuleshov. 3 May 74, 13p
Rept no. FSTC-HT-23-2589-72
Trans. of mono. Naukovedenie, Prognozirovanie, Informatika, Kiev, 1970 p152-162.

Descriptors: *Organization theory, *Industries, *Scientific organizations, Reviews, Scientific research, Evolution(Development), Theory, Translations, USSR.

The article gives a brief history of the changes in the organization of science. The author concludes that the development of scientific organizations parallels the growth of industrial organizations. Scientific organizational theory repeats the evolution of industrial organizational theory. However, due to the increased tempo of modern development, organizational theories of science are superimposed on each other.

BDX-613-1077 PC$4.50/MF$1.45
Bendix Corp., Kansas City, Mo. (Usa).
AUTOMATED SCHEDULING OF MANUFACTURING RESOURCES. TECHNOLOGICAL SPINOFF REPORT.
W. G. Hoppen. Mar 74, 26p
Contract AT(29-1)-613

Descriptors: (*Industrial plants, *Management), Automation, Buildings, Electronic equipment, Equipment, Fabrication, Inspection, Personnel, Production.

For abstract, see NSA 30 01, number 02218.

PB-232 807/8GA MF$1.45
National Academy of Sciences, Washington, D.C. Committee on Science and Public Policy.
MATERIALS AND MAN'S NEEDS. MATERIALS SCIENCE AND ENGINEERING.
Summary rept.
Apr 74, 245p* ISBN-0-309-0220-7
Library of Congress Catalog Card no. 74-2118.
Paper copy available from National Academy of Sciences, 2101 Constitution Ave., Washington, D.C. 20418 $5.75.

Descriptors: *Materials, Government policies, Forecasting, Natural resources, Research, Engineering, National government, Development, Recommendations.
Identifiers: *Technology assessment, Priorities.

The report focuses on the development and implementation of national strategies for the efficient use of national resources. It provides a comprehensive analysis and assessment of materials science and engineering, examines interactions with other areas of science and technology, and identifies research priorities not only from the standpoint of creative appeal but also in the context of societal goals, ecological constraints, and dwindling national resources. Its recommendations for research embrace the structure and properties of materials as well as their design, preparation and use.

PB-232 960/5GA PC$5.75/MF$1.45
North Carolina League of Municipalities, Raleigh.
UNIFORM RECORDS AND REPORTING SYSTEM FOR FIRE DEPARTMENTS.
Final rept.
1973, 221p* USCSC-73-NC-02C-29
Contract USCSC-73-NC-02C

Descriptors: *Fire departments, *Records management, Personnel, Safety engineering, Fire prevention, Fire protection, Systems engineering.

The report presents a model for a complete record and reporting system that could be adopted by any fire department. A major portion of the publication consists of sample forms for various records and reports, along with information on where the forms may be purchased in quantity. Records and reports are grouped into four major categories: (1) administrative, (2) fire prevention, (3) fire supression, and (4) support services. Personnel statistical training, apparatus maintenance, and communications records and reports are treated as major subheadings.

PB-233 054/6GA PC$3.00/MF$1.45
Michigan Dept. of Civil Service, Lansing.
WHAT'S IT ALL ABOUT: THE MICHIGAN PERFORMANCE STANDARD STUDY.
Final rept.
Apr 73, 17p USCSC-73-MI-05-23
Contract USCSC-73-MI-05

Descriptors: *Personnel management, *Work measurement, *Network analysis(Management), Performance evaluation, Productivity, Management planning, Time measurement, Manpower utilization, Local government, Michigan.

The report establishes the timetable and explains the procedures to be followed in conducting the Michigan Performance Standard Study. Steps to be followed in conducting such a study are listed as: (1) foreword -- a feasibility study; (2) introductory analysis, (3) detailed analysis of activities, work plan, and control processes, (4) development of the reporting system, (5) measurement of the normal pace of production, (6) development of a management program, (7) test and application, and (8) evaluation and maintenance. Under each of these headings the analyst considers three factors: the activity to be carried out, the method to be used in carrying it out, and the objective of the activity.

PB-233 061/1GA PC$10.25/MF$1.45
Missouri Municipal League, Jefferson City.
ACCOUNTING AND FISCAL ADMINISTRATION MANUAL FOR MISSOURI MUNICIPALITIES.
Final rept.
1973, 526p USCSC-72-MO-04-33
Contract USCSC-72-MO-04

Descriptors: *Financial management, *Budgeting, Allocations, Assets, Commissions(Payment), Taxes, Revenue, Fiscal policies, Auditing, Manuals, Local government, Missouri.

The report is a comprehensive manual for use by municipal officials charged with accounting or financial reporting responsibilities. Contents include sections on municipal accountability, municipal budgeting, and governmental accounting fundamentals. A complete suggested accounting system and financial reporting system is presented and explained in detail.

PB-233 133/8GA PC$7.50/MF$1.45
Presearch, Inc., Silver Spring, Md.
A STUDY OF THE IMPLEMENTATION OF THE NATIONAL ENVIRONMENTAL POLICY ACT BY THE UNITED STATES NAVY.
Final rept.,
G. L. Brubaker, R. M. Mack, D. M. McGuire, D. A. Porter, and S. Z. Stark. 1 Mar 74, 335p* PI-TR-243
Contract EQC-320

Descriptors: *Naval operations, *Environmental impacts, *Decision making, Management guidelines, Factor analysis, Constraints, Recommendations, Improvement, Methodology, Protection, Legislation.
Identifiers: National Environmental Policy Act of 1969, *Environmental safeguards.

An analysis is made of Navy's decisionmaking processes, with identification of primary decision points, and demonstration of how environmental impact analyses can contribute to Navy's decisionmaking: recommendations are made for improvements in management and environmental protection; identification of safeguards and/or recommended procedures are discussed re implementation of those safeguards. Identified are principal impediments to the use of environmental analyses.

UCRL-75486 PC$3.00/MF$1.45
California Univ., Livermore (Usa). Lawrence Livermore Lab.
LIVERMORE PLAN: MANAGING THE INDUSTRIAL TRANSITION TO METRIC.
J. W. Pearson. 25 Feb 74, 18p CONF-740601-1

Descriptors: Equipment, Industry, Lawrence livermore laboratory, Management, Mathematics, Measuring instruments, Standards, Tools.

For abstract, see NSA 30 01, number 02426.

5B. Documentation and Information Technology

AD-780 700/1GA PC$9.00/MF$1.45
Defense Documentation Center Alexandria Va
BIBLIOGRAPHY OF BIBLIOGRAPHIES IN THE DDC COLLECTION.
Report bibliography Jan 72-Feb 74.
May 74, 448p* Rept no. DDC-TAS-74-20
Updates AD-752 150 and AD-752 160.

Descriptors: *Bibliographies, *Military research, Aircraft, Meteorology, Ionosphere, Information sciences, Scientific research, Biology, Social sciences, Medicine, Chemistry, Polar regions, Earth sciences, Data processing, Electronics, Computers, Materials, Mathematics, Engineering, Manufacturing, Civil defense, Physics, Lasers, Fuels.
Identifiers: *Bibliography of bibliographies.

The bibliography is a compilation of references which were processed into the DDC data bank. It contains 316 entries covering the period January 1972 through March 1974. These citations are arranged in the following 19 COSATI Subject Categories: Aeronautics; Agriculture; Astronomy and Astrophysics; Atmospheric Sciences; Behavioral and Social Sciences; Biological and Medical Sciences; Chemistry; Earth Sciences and Oceanography; Electronics and Electrical Engineering; Energy Conversion (Non-propulsive); Materials; Mathematical Sciences; Navigation, Communications, Detection, and Countermeasures; Ordnance; Physics; and Propulsion and Fuels. Corporate Author-Monitoring Agency, Subject, Title, Personal Author, Contract, and Report Number Indexes are included. (Author)

AERE-R-7673 PC$4.00/MF$1.45
Ukaea Research Group, Harwell. Atomic Energy Research Establishment.
ON-LINE SEARCHING OF COUNCIL OF EUROPE CONVENTIONS AND AGREEMENTS: A STUDY IN BILINGUAL DOCUMENT RETRIEVAL.
N. H. Price, C. Bye, and B. Niblett. Jan 74, 16p

Descriptors: Algorithms, Computer codes, Documentation, Economics, Energy policy, Europe, Ibm computers, Information retrieval, International agreements, Laws, Legal aspects, Management, United kingdom.

For abstract, see NSA 30 01, number 02202.

COM-74-11144/4GA PC$9.75/MF$1.45
Federal Interagency Field Librarians Workshop, Washington, D.C.
PROCEEDINGS OF THE 1973 ANNUAL FEDERAL INTERAGENCY FIELD LIBRARIANS WORKSHOP (2ND) HELD IN DENVER, COLORADO ON SEPTEMBER 28, 1973.
Dec 73, 473p* DOI-als-74-05
Sponsored jointly by Corps of Engineers, Department of Commerce, Interior, Housing and Urban Development and Department of Justice Bureau of Prisons, Washington, D.C. See also report dated Dec 72, COM-73-11049.

Descriptors: *Library science, *Librarians, *Personnel development, Education, Information retrieval, Libraries, Management, Periodicals, Proceedings, Documents.
Identifiers: Information services.

The Workshop is an annual week-long training program conducted for the benefit of field librarians of the sponsoring Departments. In addition to papers, the Workshop consists of demonstrations, hands on equipment useage, tours and other training techniques. Each sponsoring Department also conducts single, agency day programs for their internal training needs. The papers are grouped under three broad subjects: Administration; Information Services; and Technical Processes.

COM-74-11194/9GA PC$20.00/MF$20.00
National Technical Information Service, Springfield, Va.
TECHNOLOGY TRANSFER A BIBLIOGRAPHY WITH ABSTRACTS.
Rept. for 1972-Jun 74,
Edward J. Lehmann. Jul 74, 158p* NTIS-WIN-74-057

Descriptors: *Technology transfer, *Bibliographies, Abstracts, Government policies, Developing countries, Feasibility, Aerospace engineering, Medicine, Urban planning, Pollution abatement, Manufacturing.
Identifiers: Technology assessment, Technology utilization.

The bibliography contains 144 selected abstracts of research reports retrieved using the NTIS online search system-NTISearch. The cited reports cover research for the period 1972 to June 1974. Included are topics on Government policies, aid to developing countries, feasibility studies, and NASA aerospace technology transfer to areas such as medicine, urban planning, pollution abatement, and manufacturing.

COM-74-50543/9GA PC-GPO/MF$1.45-NTIS
National Bureau of Standards, Washington, D.C. Office of Invention and Innovation.
THE PUBLIC NEED AND THE ROLE OF THE INVENTOR, PROCEEDINGS OF A CONFERENCE HELD IN MONTEREY, CALIFORNIA ON JUNE 11-14, 1973.
Final rept.,
Florence Essers, and Jacob Rabinow. May 74, 213p NBS-SP-388
Library of Congress Catalog Card no. 73-600324.
Paper copy available from GPO $5.55 as stock no. 0303-01261, C13.10:388.

Descriptors: *Inventions, *Demand(Economics), *Industrial development, *Meetings, Incentives, Roles(Behavior), Creativity, Environments, Optimization, Trends, Technological advancement, Industrial relations, Patents.
Identifiers: Innovations.

The book presents the proceedings of a 1973 conference held at Monterey, California. The purpose of the conference was to study the climate for invention and how to make it one in which America's inventors can flourish for the common good. A total of 18 invited papers were presented. The

proceedings, including statements from the chairmen of the three sessions, are divided into three sections with an edited version of the floor discussions following each paper. Recommendations are presented at the end of the volume.

DP-929(Rev.2)(Supp.2) PC$4.00/MF$1.45
Du Pont de Nemours (E.I.) and CO., Aiken, S.C. (Usa). Savannah River Lab.
PUBLICATIONS, 1973.
H. S. Hilborn. Feb 74, 21p
Contract AT(07-2)-1

Descriptors: (*Information, *Bibliographies), Computer codes, Research programs.

For abstract, see NSA 30 01, number 02205.

EUR-5051 PC$9.25/MF$1.45
Commission of the European Communities, Ispra (Italy). Joint Nuclear Research Center.
AUTOMATIC CLUSTERING TECHNIQUES IN INFORMATION RETRIEVAL.
M. Fritsche. 1974, 145p

Descriptors: Cluster expansion, Information retrieval.

For abstract, see NSA 30 01, number 02206.

JPRS-62172 PC$3.00/MF$1.45
Joint Publications Research Service, Arlington, Va.
GENERAL MEETING OF USSR ACADEMY OF SCIENCES,
M. V. Keldysh, and G. K. Skryabin. 5 Jun 74, 13p
Trans. from Sotsialisticheskaya Industriya (USSR), 6 Mar 74.

Descriptors: *Meetings, *Research, *USSR, Physics, Chemistry, Space sciences, Earth sciences, Translations.

The report contains speeches by the President of the USSR Academy of Sciences, M. V. Keldysh and the Acting Scientific Secretary of the Presidium of the USSR Academy of Sciences G. K. Skryabin to the annual meeting of the academy.

N74-22586/3GA PC$11.75/MF$1.45
University of Southern Calif., Los Angeles. Electronic Sciences Lab.
A SUMMARY OF THE RESEARCH PROGRAM IN THE BROAD FIELD OF ELECTRONICS.
Consolidated Semiannual Progress Report, 30 Sep. 1971 - 1 Apr. 1972.
1 Apr 72, 172p NASA-CR-138121, SAPR-15
Contract AF-AFOSR-1622-69
Subm-Sponsored Jointly by NASA, HEW, AEC Calif. Inst. Of Tech., the City of Los Angeles Dept. Of Water and Power, and the Natl. Assoc. Of Corrosion Engr.

Descriptors: *Quantum electrodynamics, *Semiconductors (Materials), *Solid state devices, *Systems engineering, Automata theory, Bioinstrumentation, Communication equipment, Computers, Control equipment.

For abstract, see STAR 1213

N74-22599/6GA PC$6.50/MF$1.45
Lockheed Electronics Co., Houston, Tex. Aerospace Systems Div.
SKYLAB-2 HANDHELD PHOTOGRAPHY ALPHABETIZED GEOGRAPHICAL FEATURES LIST.
J. L. Mcniel, and C. C. Devalcourt. Feb 74, 69p
NASA-CR-134245, LEC-2059
Contract NAS9-12200

Descriptors: *Catalogs (Publications), *Skylab program, *Skylab 2, *Spaceborne photography, Data systems, Indexes (Documentation), Information dissemination.

For abstract, see STAR 1213

N74-22613/5GA PC$5.50/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
AN OVERVIEW OF THE NATIONAL SPACE SCIENCE DATA CENTER STANDARD INFORMATION RETRIEVAL SYSTEM (SIRS).
A. Shapiro, S. Blecher, E. E. Verson, and M. L. King. May 74, 47p NASA-TM-X-69903, NSSDC-74-09

Descriptors: *Data bases, *Data retrieval, *File maintenance (Computers), *Information systems, Computer systems programs, User manuals (Computer programs).

For abstract, see STAR 1213

N74-22614/3GA PC$4.50/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
NSSDC AND WDC-A-R AND S DOCUMENT AVAILABILITY AND DISTRIBUTION SERVICES.
May 74, 29p NASA-TM-X-69904, NSSDC/WDC-A-R/S-74-10

Descriptors: *Documents, *Information retrieval, *Information systems, Catalogs (Publications), Costs, Meteorology, Rocket vehicles, Satellites, Sounding rockets.

For abstract, see STAR 1213

ORNL-4951 PC$5.45/MF$1.45
Oak Ridge National Lab., Tenn. (Usa).
ON-LINE CONVERSATIONAL RETRIEVAL SYSTEM FOR ORCHIS TEXT-ORIENTED DATA BASES USER'S MANUAL.
V. A. Singletary. Apr 74, 49p
Contract W-7405-eng-26

Descriptors: (*Computer codes, *O codes), Computers, Fortran, Ibm computers, Information retrieval, Information systems, Manuals.

For abstract, see NSA 30 01, number 02207.

PB-233 176/7GA PC$6.75/MF$1.45
Environmental Protection Agency, Washington, D.C. Library Systems Branch.
JOURNAL HOLDINGS REPORT, 1974.
May 74, 292p* EPA-LIB-74-02
See also PB-217 101.

Descriptors: *Libraries, *Pollution, Inventories, Periodicals.
Identifiers: *Environmental Protection Agency.

The report is the third annual Journal Holdings Report of the EPA Library System. It represents the holdings of all EPA libraries and the Library, Illinois Institute for Environmental Quality. It contains 2950 titles and 6821 holdings records for the participating libraries.

PB-233 214/6GA PC$7.00/MF$1.45
Commonwealth Scientific and Industrial Research Organization, Melbourne (Australia).
CSIRO ABSTRACTS, VOLUME 22, NUMBER 5, 1974.
May 74, 79p
Abstracts of CSIRO published papers: Translations. See also Vol. 22 no. 4, PB-232 241.

Descriptors: *Scientific research, *Industrial research and development, *Abstracts, Australia, Plants(Botany), Agriculture, Animal husbandry, Agronomy, Irrigation, Land use, Minerals, Textiles, Soils, Entomology, Wildlife management, Food, Oceanography, Construction, Chemical engineering, Physics, Meteorology, Mathematics, Statistics.

The abstracts cover research work published by CSIRO on animals, fishes, insects, and plants; chemical, construction, industrial, mechanical, and applied physics engineering; earth, land, minerals, and soil; meteorology; agriculture, food, and nutrition; textiles; and mathematics.

PB-233 582/6GA PC$3.75/MF$1.45
National Referral Center, Washington, D.C.
DIRECTORY OF FEDERALLY SUPPORTED INFORMATION ANALYSIS CENTERS. THIRD EDITION.
Feb 74, 65p* ISBN-0-8444-0128-5, Q223.5.U54-1974

Descriptors: *Information centers, *Directories, Federal budgets, Information retrieval, Documentation, Professional personnel, Analysis, United States Government, Distributing, Research, Organizations, Abstracts, Indexes(Documentation).
Identifiers: *Information analysis centers, Information services.

The directory describes the mission, scope, document and data holdings, information services, and qualified users of 108 centers that share two common attributes: (1) they are part of or sponsored by the federal government, and (2) they produce new, evaluated information through the collection and analysis or synthesis of information by subject specialists. Also given, in addition to the name, address, and telephone number of each center, are the names of center directors or other persons to contact, the names of sponsors, the year started, the makeup of the staff, and a list of the center's principal publications. Four indexes are included: personal names, geographic, organizations, and subject.

TID-4028-S1-R1 PC$7.60/MF$1.45
Usaec Technical Information Center, Oak Ridge, Tenn.
USAEC TRANSLATION LIST INDEX, 1970--1973.
H. L. Gardner. Apr 74, 211p

Descriptors: Availability, Bibliographies, Indexes, Information, Information retrieval, Information systems, Manuals, Us aec.

For abstract, see NSA 30 01, number 02208.

TT-70-55127 PC$9.00
National Library of Medicine, Bethesda, Md.
POLISH RESEARCH GUIDE.
1974, 634p*
Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: *Scientific research, *Technological advancement, *Poland, Reviews, Institutional framework, Organizations, Universities, Engineering, Skilled workers, Museums, Industries, Economics, Instructors, Specialized training, Agriculture, Public health, Social welfare, Libraries, Physical fitness, National defense, Marine technology, Culture(Social sciences), Arts, Translations.

A revolution in science and technology has, esetycially in the advanced countries, revealed requirements that determine social needs both as regards intellectual developments and their practical applications. If knowledge is to serve man's welfare, the overall objectives pursued by social must be known to all. Hence the importance of determining the social developments and the significance of consciousness. The importance of the human and social sciences for progress, for the attainment of a modern and harmonious development of the future consists in this.

5C. Economics

COM-73-50519-04/GA PC-GPO/MF$1.45-NTIS
Bureau of East-West Trade, Washington, D.C. Office of Export Control.
EXPORT ADMINISTRATION, 4TH QUARTER-1973.
Quarterly rept.
1973, 88p
Paper copy available from GPO $1.15 as C57.411:973/4.

Descriptors: *Export controls, *International trade agreements, Bulgaria, Czechoslovakia, East Germany, Hungary, China, Poland, Romania, USSR.
Identifiers: *Socialist countries, *East West trade.

1973 was an extraordinary year for trade between the U.S. and Socialist countries. U.S. exports to the Socialist countries reached almost $2.5 billion, nearly tripling the record rate of 1972, while imports also climbed sharply. Since a surge in trade in 1973 gave tangible and dramatic evidence of past efforts, the U.S. Government and Communist nations continue to work toward developing the commercial relationships and institutions necessary to assure a substained high rate of mutually beneficial trade.

COM-74-11095/8GA
Mag Tape $97.50;Foreign $122.50
Economic Development Administration, Washington, D.C. Office of Economic Research.
ECONOMIC DEVELOPMENT ADMINISTRATION INDUSTRIAL LOCATION PLANNING SYSTEM (ILPS) - SUMMARY DATA TAPE.
Wayne McCreedy, and Dave Portch. 1 Jun 74, 1 reel mag tape
Available only in 7 track, 556 BPI, even parity, BCD.

Descriptors: *Industrial site selection, *Regional planning, *Economic development, Economic assistance, Systems engineering, Economically depressed areas, Resources, Economic surveys, Statistical data, Magnetic tapes.

A planning system has been designed to match resources of under-developed and declining areas eligible for EDA aid with perceived industrial locational requirements. As part of this system, EDA conducted a survey of 2,950 leading manufacturing firms in 254 (5-digit product class) growth industries during the latter half of 1971. In order to distinguish between historic and current locational requirements, data were gathered on both the locational and operating characteristics of plants in operation in 1970, and the industrial location needs of companies contemplating expansion during 1971-1975. EDA published two statistical summaries of the data for 223 industries, Industrial Location Determinants, 1971-1975, and Manufacturing Plant Characteristics, 1970, in February and June, 1973.

COM-74-11129/5GA PC$18.25/MF$1.45
SYSTAN, Inc., Washington, D.C.
ANALYSIS OF ALTERNATIVE SUBSIDY PROGRAMS: IMPACT ON REGIONAL DEVELOPMENT.
Final rept. Jul 72-Aug 73,
B. K. Rogstad, M. G. Myers, R. K. Wood, C. S. Rubinger, and S. P. Wallin. Aug 73, 305p SPR-73-21 EDA/OER-74-250
Contract C-2-36716

Descriptors: *Economic development, *Regional planning, *Subsidy programs, Reviews, Economic analysis, Optimization, Economic impact, Objectives, Industries, Economic models, Policies, Economic factors.
Identifiers: Alternatives.

A methodology is developed for determining (1) the best subsidy from among capital, wage and price forms considering simultaneously (a) an EDA goal (b) the region and its characteristics; (2) the best specific subsidy program considering detailed economic and non-economic factors as well as qualitative factors; and (3) the most appropriate industries to receive EDA subsidies in a region in terms of the types of firms most likely to respond to EDA incentives and thereby further EDA's objectives. An economic model provides a technique for assessing the relative effectiveness of alternative wage, price, and capital subsidy forms.

COM-74-11195/6GA PC$3.25/MF$1.45
Kentucky Research Foundation, Lexington.
COMMERCIAL BANKING IN GROWTH REGIONS.
Research rept.,
L. Randolph McGee. Aug 70, 28p Discussion Paper-34 EDA/OER-74-249
Grant EDA-OER-227-G-68-11

Descriptors: *Commercial banking, *Regional economy, *Economic development, *Policies, Reviews, Regional development, Growth rate, Developing countries, Economic needs, Factor analysis, Economic structure, Banking practices.

A focus is made on the issues of the banking role in the process of regional economic growth. The discussion is limited to rapidly growing regions in a developed national economy. The role of banking in regions of underdeveloped nations may be quite different from the role outlined in this paper, but some of the growth factors discussed herein would be relevant. After discussing national versus regional banking and banking functions in a growth region, the author notes that it would be presumptuous to suggest specific guidelines for measuring banking performance in growth regions, since regions grow in differing ways and specific demands for financial services vary.

COM-74-50061/GA PC$0.25/copy
FOREIGN ECONOMIC TRENDS AND THEIR IMPLICATIONS FOR THE UNITED STATES.
1974,147 issues.
Paper copy available from GPO $37.50/year as C42.30.

The series of reports presents current business and economic developments in every country that offers a present or potential market for United States goods. The reports include a summary of the prospective impact on the United States economy, changing trade patterns prospective business trends, balance of payments, government policies, and investments. For individual country reports, order by COM-number listed below:
ET-74-046. Hong Kong. Semiannual rept. May 74, supersedes ET-73-126 **COM-74-50061-046/GA**
ET-74-047. Laos. Annual rept. May 74, 11p, supersedes ET-71-052 **COM-74-50061-047/GA**
ET-74-055. Iran. Semiannual rept. Jun 74, 11p, supersedes ET-73-144, COM-73-50185-144 **COM-74-50061-055/GA**

COM-74-50112-05/GA PC-GPO/MF$1.45-NTIS
Bureau of Economic Analysis, Washington, D.C.
SURVEY OF CURRENT BUSINESS. VOLUME 54, NUMBER 5, PART 1, MAY 1974.
Monthly periodical rept.
May 74, 80p BEA-SCB74-54-05-Pt-1
Paper copy available from GPO $34.45/year as C56.109:54, including weekly statistical supplement, $2.25/copy as C56.109:54/05; microfiche also available from NTIS $9.00/year.

Descriptors: *Current business statistics, *Economic surveys, *Economic intelligence, Statistical data, International trade, Balance of payments, Capital expenditures, Corporate profits, Regional economic activity, Gross national product, Personal income, Gross national product, Travel, Income taxes.
Identifiers: *Business economics, Monthly summaries, Passenger fares.

In addition to 2,500 statistical series, the issue contains a roundup of the business situation, reconciliations of major statistical series, recent financial developments, recent trends in automobile sales, recent developments in inventory-sales ratios, first quarter foreign trade, balance of payments, U.S. international transactions, by Areas, and special articles.

COM-74-50113/GA
PC-GPO/MF$1.45-NTIS/copy
Domestic and International Business Administration, Washington, D.C.
OVERSEAS BUSINESS REPORTS.
1974,approx. 99 issues-NTIS/copy
Paper copy available from GPO $28.50/year as C1.50:74, $0.30/copy.

The reports present basic authoritative information for exporters, importers, investors, manufacturers, researchers, and those concerned with international trade and economic conditions. For individual reports, see below:
OBR-74-22. United States Trade with Major World Areas, 1968-1973. Jun 74, 68p **COM-74-50113-22/GA**

COM-74-50544/7GA PC-GPO/MF$1.45-NTIS
Bureau of Domestic Commerce, Washington, D.C.
WORLD MOTOR VEHICLE PRODUCTION AND REGISTRATION, 1972-73,
Thomas C. Meehan. Apr 74, 8p
Paper copy available from GPO $0.25.

Descriptors: *Motor vehicles, Production, Passenger vehicles, Motor trucks, Buses(Vehicles), United States, Statistical data, Records.
Identifiers: Foreign countries, World production, Motor vehicle registrations.

The report lists in tabular form the production of passenger vehicles, trucks and buses throughout the world for 1972-73, and compares figures with the last year of reporting. World registrations of motor vehicles are tabulated similarly.

COM-74-50547/0GA PC-GPO/MF$1.45-NTIS
Bureau of East-West Trade, Washington, D.C.
SELECTED U.S.S.R. AND EASTERN EUROPEAN TRADE AND ECONOMIC DATA.
May 74, 58p
Paper copy available from GPO $0.95.

Descriptors: *International trade, *Economic surveys, *Eastern Europe, Market profiles, USSR, United States, Population characteristics, Statistical data.

The publication presents economic data intended to provide some insight into the potential of the Eastern European market for U.S. goods and services. It summarizes trade patterns between the Eastern European countries and the U.S. and other Western industrialized nations. Background economic and population data for the socialist countries are included to show their development patterns and potentials.

COM-74-70065/9GA PC-GPO
Bureau of the Census, Washington, D.C.
CENSUSES OF MANUFACTURES AND MINERAL INDUSTRIES, 1967. INDEXES OF PRODUCTION.
Special rept.
Nov 73, 103p MC67(S)-6
Paper copy available from GPO $1.85 as C3.24/15:967/6.

Descriptors: *Economic census, *Census, *Industry productivity, Tables(Data), Manufacturers, Industries, Minerals, Mining, Industry shipments.

The report presents measures of change in manufacturing and mining output from 1963 to 1967 with

historical comparisons. Data are provided for the country as a whole and are based on the 1963 and 1967 censuses of manufactures and mineral industries. Indexes have been compiled by developing detailed deflators and weights for the value of output of 472 manufacturing and mining industries. These have been combined into 168 minor industry groupings, 26 major industry groupings, and six market groupings. The indexes are based on shipment data collected in the census of manufactures and census of mineral industries for 1963 and 1967 and the report also provides extensive methodological tables.

COM-74-70069/1GA PC-GPO
Bureau of the Census, Washington, D.C.
FROM THE OLD TO THE NEW 1972 STANDARD INDUSTRIAL CLASSIFICATIONS FOR ESTABLISHMENTS,
Harold T. Goldstein. Oct 72, 35p Technical Paper-28
Paper copy available from GPO $0.60 as C56.215-2:28.

Descriptors: *Standard industrial classifications, *Economic changes, Reviews, Census tabulations, Private industry, Statistical data, Sector changes, Economic analysis, United States.

The report describes how the 1967 Standard Industrial Classifications (SIC) for establishments were changed for 1972, with particular reference to industries within scope of the 1967 economic censuses. It provides selected statistics on the 1967 SIC industries affected by change. All data are in terms of establishments in the private sector of the economy.

COM-74-70074/1GA PC-CENSUS
Bureau of the Census, Washington, D.C.
RAW MATERIALS IN THE UNITED STATES ECONOMY: 1900-1969,
Vivian Eberle Spencer. Jul 72, 73p Working Paper-35
Paper copy available from Bureau of the Census, Washington, D.C. 20233 $1.00.

Descriptors: *Raw materials, *Economic surveys, United States, Statistical data, Production rate, Consumption rate, Trends, Utilization, Classifications, Sources, Prices, Reviews.

The report provides data on the production and consumption of raw materials in the United States economy, 1900-1969. The initial chapter provides background and summary information on raw materials. It discusses previous reports issued and highlights the major contributions of this report towards basic raw materials data. A summary of significant findings is listed along with definitions of significant phrases used. Additional chapters discuss raw materials trends in the 1960's in the United States, the changing pattern of raw materials use in terms of classification of materials and per capita consumption and sources of raw materials and prices.

COM-74-70076/6GA PC-CENSUS
Bureau of the Census, Washington, D.C.
ECONOMIC CENSUSES OF THE UNITED STATES: HISTORICAL DEVELOPMENT,
Charles G. Langham. Jun 73, 26p Working Paper-38
Library of Congress Catalog Card no. 73-600143.
Paper copy available from Bureau of the Census, Washington, D.C. 20233. $0.50.

Descriptors: *Economic census, *Census, Tables(Data), Manufacturing, Industries, Mineral economics, Construction, Transporation, Fishing.

The working paper traces the historical development of the economic censuses of the United States during the 19th and 20th centuries. The first part of the paper discusses the scope and coverage of economic censuses in relation to the growth of the American economy in the 19th century. The second part concerns the expansion of the economic censuses to cover manufacturing, mineral industries, business, construction, fisheries, and transportation and discusses the changes in the economic censuses in relation to wartime and postwar needs and the advent of computer technology.

JPRS-62119 PC$7.50/MF$1.45
Joint Publications Research Service, Arlington, Va.
ECONOMICS OF THE SHIPBUILDING INDUSTRY,
S. P. Loginov. 30 May 74, 328p
Trans. of mono. Ekonomika Sudostroitelnoi Promyshlennosti, Leningrad, 1966 347p.

Descriptors: *Shipbuilding industry, *Economic surveys, *USSR, Automation, Organizations, Management, Capital, Labor relations, Salaries.

The report contains a textbook on the economics of the shipbuilding industry. Topics discussed include economics of modern shipbuilding, the role of automation and mechanization, planning of production and supply, and industrial management.

JPRS-62140 PC$3.00/MF$1.45
Joint Publications Research Service, Arlington, Va.
REGIONAL PROBLEMS OF SCIENTIFIC TECHNICAL PROGRESS,
N. N. Nekrasov, and V. I. Duzhenkov. 3 Jun 74, 20p
Trans. of Priroda (USSR) n2 p2-9 1974.

Descriptors: *USSR, *Economic surveys, *Technological progress, Industries, Natural resources, Economic development, Research, Translations.

The report contains an examination of the distribution of the country's scientific potential according to economic regions.

JPRS-62194 PC$3.00/MF$1.45
Joint Publications Research Service, Arlington, Va.
COMPUTERS IN ECONOMICS AND SCIENTISTS OF THE FUTURE,
N. P. Fedorenko, and N. A. Dollezhal. 7 Jun 74, 15p
Trans. from Budushchee Nauki (USSR) p11-28 1972.

Descriptors: *Economic management, *Data processing, *Government, *USSR, Planning, Control, Personnel, Translations.

The report contains data on a government-wide automated control system and on the scientific worker of the future.

PB-232 712/0GA PC$13.00/MF$1.45
Bureau of the Budget, Washington, D.C.
STANDARD INDUSTRIAL CLASSIFICATION MANUAL, 1967.
1967, 613p*
See also PB-223 985.

Descriptors: *Standard industrial classifications, *Manuals, Standard industrial classification code, Data processing, Standardization, Economic surveys, Industries, Trade, Finance, Services, Indexes(Documentation).

The Standard Industrial Classification was developed for use in the classification of establishments by type of activity in which engaged; for purposes of facilitating the collection, tabulation, presentation, and analysis of data relating to establishments; and for promoting uniformity and comparability in the presentation of statistical data collected by various agencies of the United States Governments, State agencies, trade associations, and private research organizations. The Classification is intended to cover the entire field of economic activities: agriculture, forestry, and fisheries; mining; construction; manufacturing; transportation, communication, electric, gas, and sanitary services; wholesale and retail trade; finance, insurance, and real estate; services; and government.

PB-232 863/1GA
Mag Tape $97.50;Foreign $122.50
Agricultural Stabilization and Conservation Service, Washington, D.C. Data Systems Div.
FEED GRAIN, WHEAT AND COTTON REPORTS MASTER FILE: 1973,
Frank Lawson, Gerald Deibert, and Charles Crank. Sep 73, 1 reel mag tape DS-55R
Available as STC Model 3450-5, Standard OS-360 headers/trailers, 9 track, 1600 BPI, EBCDIC.

Descriptors: *Agricultural development and assistance, *Federal programs, *Participative management, Data files, Projects, Feeding stuffs, Wheat, Cotton plants, Statistical data, Farms, Land, Farm crops, Allocations, Payment, Classifications, Magnetic tapes.
Identifiers: *Set aside programs, *Voluntary participation, Eligibility.

The file records by county the following data on voluntary participation in the 1973 feed grain, wheat and cotton set-aside programs: the number of farms eligible and the number of farms and producers participating, applicable acres of cropland, conserving base, feed grain bases, wheat and cotton allotments, set-aside acreage, payments and reductions, and planted acres for each crop. Data are as recorded through September 1973. Additions corrections and/or adjustments subsequent to that date are not included. Source documents include producer participation and compliance data on sheets prepared and furnished by ASCS county offices, and the 1973 Set-Aside Programs Annual Report.

PB-232 976/1GA PC$13.75/MF$1.45
California Univ., Berkeley. Inst. of Business and Economic Research.
CALIFORNIA ECONOMIC FORECASTING PROJECT, BAY AREA RESEARCH PROGRAM.
Final rept.,
Mar 74, 212p OPR-74-03

Descriptors: *Econometric models, *California, *Economic forecasting, Standard metropolitan statistical areas, Counties, Economic analysis, Constraints, Data retrieval, Reviews, Data files, Machine readable data, Systems analysis.
Identifiers: *San Francisco Bay area.

The objective of the research program has been to develop econometric models of the four standard metropolitan statistical areas (SMSAs), within the nine-county San Francisco Bay area, as a pilot program in designing local area models for economic analysis and short-term forecasting. The models treat the local area economies as open subsystems within the state and national economies, within the constraints of existing data. The regional data situation is reviewed and a directory of data which is assembled and maintained in machine readable form during the research program is given. Several applications of the models are suggested. Some results of an economic impact study are presented.

PB-233 063/7GA PC$5.00/MF$1.45
Indiana Univ., Bloomington. School of Public and Environmental Affairs.
TRAINING MANUAL FOR TAX AUDITING WORKSHOP.
Final rept.,
J. Mikesell, J. Wilson, M. France, and P. Kinder.
Jan 74, 175p USCSC-72-IN-06-38
Contract USCSC-72-IN-06

Descriptors: *Auditing, *Income taxes, Accounting, Manuals, Workshops, Personnel development, Indiana.

The manual is intended for training members of the Audit Division, Indiana Department of Revenue. It is specific to the needs of that organization, but also includes much material generic to a wide range of enforcement activities.

PB-233 083/5GA PC$4.00/MF$1.45
Howard Univ., Washington, D.C. School of Engineering.
SEMINAR SERIES: TECHNOLOGY AND DEVELOPMENT. VOLUME I,
Leatha S. Henson. 30 May 74, 90p*
Contract AID/csd-3622
see also Volume 2, PB-233 084.

Descriptors: *Developing countries, *Technological advancement, *Reviews, *Meetings, History, Technical assistance, Africa, Technology transfer, Environmental issues, Human factors engineering, Universities, Economic factors, Economic changes.
Identifiers: Howard University.

The report contains lectures presented during a series of Howard University seminars on technology and development in developing countries. The purpose of the seminars was to examine the process of development, the role of technical assistance, and the application of technology to the needs of these countries. Volume one deals with historical perspectives, intermediate cumulative processes, global development and underdevelopment, problems relating to human factors, environmental considerations, economic factors, and anticipated changes. The main focus is on the developing countries of Africa.

PB-233 084/3GA PC$4.00/MF$1.45
Howard Univ., Washington, D.C. School of Engineering.
SEMINAR SERIES: TECHNOLOGY AND DEVELOPMENT. VOLUME II,
Leatha S. Henson. 30 May 74, 100p*
Contract AID/csd-3622
See also Volume 1, PB-233 083.

Descriptors: *Developing countries, *Technological advancement, *Meetings, Africa, Energy resources, Communications management, Technical resources, Water supply, Droughts, Waste water, Agricultural research, Transportation development, Unieersities.
Identifiers: Howard University.

The document contains the speeches and biographical sketches of the participants of the second series of a two-part seminar series dealing with technology in developing countries conducted by the School of Engineering of Howard University during the 1973-74 school year. Volume two of a two part report contains materials on solar energy, world energy problems, the international communication satellite system, technical infrastructure, water supply and wastewater disposal, demographic and sociocultural factors of drought, international agricultural research, and transportation in developing countries. The major concern is for the developing nations of Africa.

PB-233 085/0GA PC$6.00/MF$1.45
Gellman Research Associates, Inc., Jenkintown, Pa.
ECONOMIC REGULATION AND TECHNOLOGICAL INNOVATION: A CROSS-NATIONAL LITERATURE SURVEY AND ANALYSIS. VOLUME I. ANALYSIS.

Jan 74, 238p NSF/RDA-3-3-1
Grant NSF-DA-39394

Descriptors: *Industrial controls, *Government industry relationships, *Reviews, *Regulations, Economic controls, Technological advancement, Interactions, Documents, Abstracts, Analyzing, Forecasting, United States, Canada, Great Britain, West Germany, Japan, Transportation, Telecommunication, Utilities.
Identifiers: Innovations, *Regulated industries, Alternatives.

The objective of the study was to survey and analyze the literature concerning the relationship between economic regulation and technological innovation in three regulated industries that has been published since World War II in six industrialized nations. The countries surveyed were the United States, Canada, Great Britain, France, West Germany, and Japan; the industries specifically considered were transportation, communications, and the energy utilities.

5D. History, Law, and Political Science

AD-780 592/2GA PC$5.25/MF$1.45
Center for Naval Analyses Arlington Va
THE SOVIET NAVAL PRESENCE DURING THE IRAQ-KUWAITI BORDER DISPUTE: MARCH-APRIL 1973,
Anne M. Kelly. Jun 74, 45p Rept no. CNA-Professional Paper-122

Descriptors: *Iraq, *USSR, *Political science, Naval vessels, Power, Behavior, Foreign policy.

The subject of the paper is the visit of Admiral Gorshkov and a contingent of Soviet naval ships to Iraq in April 1973, at the time of the Iraq-Kuwaiti border dispute. First, the events which occurred prior to the arrival of the Soviets are reviewed. Then, several hypotheses about Soviet behavior are discussed, and a plausible explanation is suggested. The paper concludes with observations on the implications of this diplomacy. Although the evidence is circumstantial and incomplete on Soviet objectives, there is sufficient evidence that more than a routine port visit occurred. That is, it was an exercise in crisis diplomacy.

AD-780 943/7GA PC$10.00/MF$1.45
Naval Postgraduate School Monterey Calif
IMPLICATIONS OF THE EMERGING LAW OF THE SEA TO THE U. S. NAVY.
Master's thesis,
Joseph Lambert Wiggins. Mar 74, 136p

Descriptors: *Oceans, *International law, Ocean bottom, Natural resources, National defense, Water pollution, International relations, United States Government, Navy, Theses.
Identifiers: *Law of the Sea, Territorial seas, Government policies.

Seven major issues in dispute at the United Nations Conference on the Law of the Sea and affecting the U.S. Navy are examined from the standpoints of Naval interests as well as the Nation and the international community. The issues are: National security and peaceful use of the oceans, The territorial sea, International straits, Marine resources, Marine scientific research, Marine pollution, The international regime. Solutions to the issues are argued and compared from the perspectives of the international community as a whole, the United States and the U. S. Navy. It is shown that the best solutions for both the United States and its naval force appear to be in the direction of greater international jurisdiction for the world's seas and, thus, the U.S. stands to gain the most from an effective and widely accepted international ocean regime. The roles of the U.S. Navy and other international navies as peacekeepers and marine managers supporting a new international ocean order are also explored. (Author)

JPRS-62185 PC$5.50/MF$1.45
Joint Publications Research Service, Arlington, Va.
TRANSLATIONS ON USSR POLITICAL AND SOCIOLOGICAL AFFAIRS, NUMBER 532,
M. Maksimova, and D. V. Kukharchuk. 6 Jun 74, 50p
Trans. from various jnls.

Descriptors: *USSR, *Political science, Sociology, Translations, Government, Communism, Law(Jurisprudence), Education, Culture(Social sciences).

The report contains information on government and party structure, policy and problems, law and social regulation, education, and cultural and social aspects of Soviet life.

PB-232 426/7GA PC$9.50/MF$1.45
Santa Clara County Pretrial Release Program, San Jose, Calif.
SANTA CLARA COUNTY PRETRIAL RELEASE PROGRAM. PRETRIAL RELEASE PROGRAM IN AN URBAN AREA.
Final rept.
1973, 127p
Grant LEAA-71-DF-701

Descriptors: *Judicial review, *Criminal investigations, Bonds, Police, Courts, Law enforcement.
Identifiers: Arrest to court disposition processes, Felonies, Misdemeanors, Parole systems, Bail bond system.

The one-year project was designed to release quickly from pretrial custody, in lieu of bail, all persons who promise to appear in court and have characteristics which indicate a high probability of appearing on their own recognizance. The final report is organized into three 'stand-alone' sections, all designed to promote technology transfer and dissemination of results and program methods. Section I contains a brief description of the program, a short summary of results, and comment on the demonstration by the Director of the project. Section II contains the complete report of the independent evaluator of the program. This evaluation shows that the program, in addition to furthering the interest of justice, has resulted in considerable savings to both the accused and the community. Significantly, Santa Clara County has fully supported program financing in its second and third years of operation; and the program has served as a model for other jurisdictions. Section III contains a complete manual of procedures for the program. (Modified author abstract)

PB-233 216/1GA PC-GPO/MF$1.45-NTIS
Bureau of Mines, Washington, D.C.
SUMMARY OF MINING AND PETROLEUM LAWS OF THE WORLD. 5. EUROPE.
Information circular 1965-71,
Northcutt Ely. May 74, 92p* BUMines-IC-8631
Prepared by Watergate Six Hundred Building, Law Offices of Northcutt Ely. Supersedes report no. PB-192 203. See also Part 4, PB-231 863.
Paper copy available from GPO $1.25 as stock no. C.128.27:8631.

Descriptors: *Law(Jurisprudence), *Mining, *Crude oil, *Western Europe, Minerals, Natural resources, Legislation, Petroleum industry, Natural gas, Offshore drilling, Exploration, Claims, Fees, Taxes, Regulations, Administrative law, Leasing.

The volume summarizes mining and petroleum legislation in 18 European jurisdictions. Within these jurisdictions, primary attention is given to requirements that must be met in each country for acquisition of rights to permit development of mineral resources. Coverage includes: First, identification of the controlling laws or statutes governing minerals acquisition and reference to the administrative authority; second, analysis of the laws governing mines and quarries and their products; third, analysis of laws applicable to natural gas, petroleum, and related materials; and fourth, mention of laws regulating offshore operations. Where pertinent, sections dealing with

historical background or administration have been added. In countries where minerals are subject to control of States or Provinces, those areas are considered separately from the central government.

5E. Human Factors Engineering

AD-780 627/6GA PC$8.25/MF$1.45
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Engineering
ANALYSIS OF THE DYNAMIC RESPONSE OF THE HUMAN VERTEBRAL COLUMN.
Master's thesis,
George M. P. Marton. Mar 74, 102p Rept no. GAW/MC/74-6

Descriptors: *Spinal column, *Dynamic response, *Biomechanics, Humans, Stresses, Skeleton, Response, Theses, Models, Impedance.
Identifiers: Kelvin functions, Recommendations.

The development of a model of the human vertebral column is investigated. The model is assumed to consist of only linear elements and only axial response is considered. The intervertebral disc is modelled by a chain of Kelvin elements in series with an impact spring. The vertebra is modelled by a Maxwell element in parallel with a spring and in series with a mass. The response of the model is shown to correspond closely to impedance results at the elemental level but the model of the combination of three vertebrae and two discs gives results which are low when compared to experimental impedance results. (Author)

AD-781 124/3GA PC$3.25/MF$1.45
Raytheon Co Sudbury Mass Equipment Development Labs
SYSTEMS EFFECTIVENESS ANALYZER.
Summary rept. Feb 72-Apr 73,
William T. Polak, James C. Robertson, and Li S. Yuan. Feb 74, 32p Rept no. RAY-ER-73-4340-2 AMRL-TR-73-113
Contract F33615-72-C-1442

Descriptors: *Weapon systems, *Man machine systems, *Computerized simulation, Track while scan, Kill probabilities, Aerial gunnery, Efficiency, Ballistics, Miss distance, Circular error probable, Target acquisition, Flight paths.
Identifiers: *SEA(Systems Effectiveness Analyzers), *Systems effectiveness analyzers.

The Systems Effectiveness Analyzer (SEA) is a weapon system effectiveness measuring system which is based primarily upon the utilization of existing equipment (controllers and peripherals) supplemented by the additional software required to enhance existing AMRL capabilities to evaluate simulated weapon systems. The SEA System has two major functions. First to checkout, control, monitor and perform statistical analyses associated with tracking simulators. Second, to provide an estimation of weapon system effectiveness. The weapon system includes the human tracker as its principal sensor of target motion. The metrics used to evaluate weapon system performance are the weapon's round-by-round probability of kill and the resulting target's probability of survival. Angular error statistics are used to evaluate tracker performance. The report describes the SEA system functions and interfaces and discusses the models used for the analysis of system effectiveness. (Author)

COM-74-11079/2GA PC$4.00/MF$1.45
National Bureau of Standards, Washington, D.C. Engineering Mechanics Section.
TEST AND EVALUATION OF BABY WALKERS AND WALKER-JUMPERS.
Final rept.,
Daniel J. Chwirut. May 74, 20p NBSIR-74-434

Descriptors: *Accident investigations, Equipment, Performance(Engineering), Human factors engineering, Safety engineering, Infants, Standards, Evaluation, Tests.
Identifiers: *Baby walkers, Consumer protection.

Accident reports from hospital emergency rooms were surveyed to determine the probable causes of accidents involving baby walkers and walker-jumpers. Test methods were developed to simulate service conditions to determine if the characteristics leading to accidents are present in all or only a few of the items on the market. These test methods include tests for dynamic and static stability, step roll-over stability, plastic bead strength, durability, and location of scissor joints. The test methods and performance criteria are intended to supply information leading to federal safety standards.

N74-21732/4GA PC$6.25/MF$1.45
Rancho Los Amigos Hospital, Inc., Downey, Calif.
DEVELOPMENT OF AN EXTERNALLY POWERED PROSTHETIC HOOK FOR AMPUTEES.
Final Project Report, 27 Mar. 1971 - 30 Apr. 1973.
A. Karchak, Jr., J. R. Allen, and E. L. Bontrager. 30 Apr 73, 63p NASA-CR-120213
Contract NAS8-27020

Descriptors: *Electric control, *Fingers, *Hand (Anatomy), *Hooks, *Proportional control, *Prosthetic devices, Human body, Human factors engineering, Implanted electrodes (Biology), Medical equipment, Myoelectric potentials.

For abstract, see STAR 1213

N74-21734/0GA PC$4.00/MF$1.45
Scientific Translation Service, Santa Barbara, Calif.
WALKING IN OPEN SPACE.
G. Titov. Apr 74, 10p NASA-TT-F-15526
Contract NASW-2483
Tran-Transl. Into English from Aviat. Kosmonavt. (Moscow), No. 1, Jan. 1974 p 34-35.

Descriptors: *Astronauts, *Extravehicular activity, *Orbital workers, *Walking, Astronaut maneuvering equipment, Orbital space stations, Rescue operations, Space maintenance, Spacecrews.

For abstract, see STAR 1213

N74-21735/7GA PC$4.00/MF$1.45
Kanner (Leo) Associates, Redwood City, Calif.
ERGONOMICS: A NEW SCIENCE FOR MAN.
L. Chaynova. Apr 74, 7p NASA-TT-F-15527
Contract NASW-2481
Tran-Transl. Into English from Tekhn. Molodezhi (Moscow), No. 12, Dec. 1973 p 18-19.

Descriptors: *Biometrics, *Functional analysis, *Human factors engineering, *Man machine systems, Computerized design, Equipment specifications, Operator performance, Production engineering.

For abstract, see STAR 1213

N74-21736/5GA PC$8.75/MF$1.45
Virginia Univ., Charlottesville. Research Labs. for the Engineering Sciences.
ENVIRONMENTAL CRITERIA FOR HUMAN COMFORT. A STUDY OF THE RELATED LITERATURE.
Final Report.
I. D. Jacobson. Feb 74, 113p NASA-CR-138144, BE-4088-101-74
Contract NGL-47-005-151

Descriptors: *Aircraft industry, *Bibliographies, *Human factors engineering, Acceleration tolerance, Motion sickness, Noise intensity, Pressurized cabins, Temperature control.

For abstract, see STAR 1213

PATENT-3 801 988 Not available NTIS
Department of the Air Force Washington D C
PRESSURE GLOVE.
Patent,
Alfred L. Marcum, Jr., and Donald A. Rosenbaum. Filed 1 Nov 71, patented 9 Apr 74, 4p Rept nos. PAT-APPL-194 162,
Government-owned invention available for licensing. Copy of patent availableCommissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Gloves, Human factors engineering, Clothing, Pressure.
Identifiers: PAT-CL-2-161-R.

The invention describes a pressure glove having a single layer on the palm side of the glove with the restraint member being embedded in the gas barrier layer. The restraint member on the front and back of the fingers being made of an anistropically expandable material having greater expansion in the longitudinal direction than in the direction across the fingers. An interliner is provided which extends only to the base of the palm of the palm side of the hand, but which extends into the fingers on the back of the hand to urge the hand of the wearer against the palm side of the glove.

5G. Linguistics

AD-780 957/7GA PC$3.75/MF$1.45
Cryptanalytic Computer Sciences Inc Cherry Hill N J
PHRASE DICTIONARY DISTRIBUTION ANALYSIS AND GROWTH PREDICTION REPORT.
Final rept. 26 Jan-26 Apr 74,
J. H. Waite, R. Boehm, J. G. Fisher, S. D. Epstein, and D. J. Stewart. 26 Apr 74, 56p
Contract DAAA21-74-C-0269

Descriptors: *Information retrieval, *Dictionaries, Words(Language), Occurrence, Models, Predictions, Computational linguistics, Computer applications.
Identifiers: Phrase structure.

The report describes a study of the DDC Phrase Glossary. It includes a computer program to tabulate word frequencies for blocks of phrases of optional sizes. On the basis of these distributions, empirical and statistical analyses are made including two prediction models. Two-word distributions are also included. Based upon the available distributions, a two-word Phrase Glossary size of 320,000 two-word phrases was determined. Also included are analyses of various techniques, such as suffix truncation, imbedded phrases, and query effectiveness. Comparisons are made of the DDC system to other plain language machine retrieval systems. (Author)

5H. Man-Machine Relations

AD-781 032/8GA PC$3.25/MF$1.45
Aerospace Medical Research Lab Wright-Patterson AFB Ohio
DISPLAY DESIGN FOR ELECTRONIC COUNTERMEASURES APPLICATION--SYMBOL CODING AND RANGE PRESENTATION.
Final rept.,
William N. Kama, David E. Thorburn, John P. Lyons, and Aldo Gillio. Nov 73, 43p Rept no. AMRL-TR-73-42

Descriptors: *Aerial warfare, *Attack, *Information systems, *Display systems, *Warning systems, Pilots, Electronic countermeasures, Environments, Enemy, Fighter aircraft, Range(Distance), Information processing, Threat evaluation, Coding, Symbols, Standardization.

A study was conducted to determine which coding systems (used to highlight critical and supercritical events) on a threat-warning display would lead to optimal performance in terms of identifying and locating such events, and determine the best means of presenting range information. Four cod-

ing systems were used, each with three range presentations: a conventional map, an expanded inner range, and an exponential display. A 30-minute simulated air penetration mission against two heavily defended complexes was flown by 24 subjects. During the mission the subjects were required to perform a symbol identification task, a monitoring task and a tracking task. A symbology set is recommended as a result of the tests. (Modified author abstract)

5I. Personnel Selection, Training, and Evaluation

AD-780 539/3GA PC$4.25/MF$1.45
Center for Naval Analyses Arlington Va
PROCUREMENT AND RETENTION OF NAVY PHYSICIANS,
Eugene J. Devine. Jun 74, 25p Rept no. CNA-Professional Paper-121

Descriptors: *Naval personnel, *Physicians, Salaries, Medical personnel, Training, Procurement.
Identifiers: All volunteer armed forces, Grants.

The report evaluates the current incentive plans for recruitment and retention of physicians in the all-volunteer environment of today's Navy: a medical scholarship program and an annual bonus plan for supplementing salary. Under the scholarship program, the military pays tuition and fees for Medical education in return for a period of obligatory service. The study discusses whether this program would enable the Navy to attract and retain enough physicians to meet staffing levels, as compared to alternative methods of recruitment.

AD-780 558/3GA PC$3.00/MF$1.45
Civil Aeromedical Inst Oklahoma City Okla
A SEX COMPARISON OF REASONS FOR ATTRITION OF NON-JOURNEYMAN FAA AIR TRAFFIC CONTROLLERS,
John J. Matthews, William E. Collins, and Bart B. Cobb. Mar 74, 17p FAA-AM-74-2

Descriptors: *Air traffic controllers, *Attrition, Employment, Personnel selection, Job satisfaction, Retention(General), Job training.
Identifiers: Sex discrimination(Employment).

Recent ATC attrition rates showed no sex differences in the proportion of trainees who completed FAA Academy training; however, the percentage of females who subsequently left ATC work was over twice that of male trainees. In the present study, the 56 females who entered the Academy between December 1968 and November 1970, and who were no longer with the FAA as of June 1972, were matched on several variables with male attritions who had entered the Academy at the same time. Reasons for attrition were obtained from job-exit forms, telephone interviews, and a questionnaire. (Modified author abstract)

AD-780 688/8GA PC$3.00/MF$1.45
Human Resources Research Organization Alexandria Va
SIMULATION AND AIRCREW TRAINING AND PERFORMANCE.
Professional paper,
Wallace W. Prophet, and Paul W. Caro. Apr 74, 15p Rept no. HumRRO-PP-4-74
Presented at OCRD Conference, Fort Rucker, Ala., Nov. 73.

Descriptors: *Flight crews, *Training devices, Army personnel, Flight simulators, Cost effectiveness, Aeronautics, Training, State of the art, Reviews.

The paper outlines some major areas of use of simulation in Army Aviation and comments on current research. Equipment development, crew performance studies, concept development and training are discussed. Only in the training area has the Army made substantial progress. A broad program of simulation research with emphasis on engineering and behavior is suggested toward the goal of improving aircrew performance. There are significant simulation research problems unique to the Army which need to be worked out. (Author)

AD-780 689/6GA PC$3.00/MF$1.45
Human Resources Research Organization Alexandria Va
DEVELOPMENT AND EVALUATION OF A PRE-SCHOOL STUDY MANUAL FOR DRILL SERGEANT CANDIDATES.
Professional paper,
William C. Osborn, and Ronald E. Kraemer. Apr 74, 16p Rept no. HumRRO-PP-5-74
Contract DAHC19-70-C-0012

Descriptors: *Individualized training, *Instructors, *Army personnel, Students, Performance(Human), Assessment, Instructional materials, Manuals, Transfer of training, Attitudes(Psychology).
Identifiers: Qualifications.

Research was conducted to develop and evaluate study materials that would help prospective Drill Sergeant candidates prepare for Drill Sergeant school. A Study Manual containing relevant readings, study objectives, and self-tests was prepared. Diagnostic exams were developed and used to evaluate the achievement of a class of Drill Sergeant candidates who used the manual in their pre-school study program. (Modified author abstract)

AD-780 778/7GA PC$3.25/MF$1.45
General Dynamics Corp Groton Conn Electric Boat Div
BASIC AND ADVANCED SUBMARINE OFFICER'S TACTICAL TRAINING DEVICE REQUIREMENTS.
Executive summary Mar 71-Jul 73,
Alan J. Pesch, and Thomas J. Hammell. Apr 74, 30p NAVTRAEQUIPC-72-C-0053-1(A)
Contract N61339-72-C-0053
See also report AD-726 428.

Descriptors: *Military tactics, *Submarine personnel, *Officer personnel, *Military training, Military requirements, Submarines, Performance(Human), Training devices, Methodology, Modification, Computer applications, Technology, Weapon systems, Mathematical models, Display systems.
Identifiers: Recommendations.

The report is a summary of several documents on basic and advanced officer tactics training. These investigations examine submarine officer's tactical training requirements and recommend an overall plan to advance submarine technology. The major recommendations center about current methodology via computer-driven performance effectiveness models. Based on the output of these models, future training devices may include diagnostic displays of training performance. Recommendations include the development of generalized individual trainers, specific modifications to existing devices, and locations for new devices. (Modified author abstract)

AD-780 796/9GA PC$3.25/MF$1.45
Logistics Management Inst Washington D C
ROLE AND MISSION OF THE CONTRACTING OFFICER.
May 74, 46p Rept no. LMI-74-2
Contract SD-321

Descriptors: *Logistics planning, *Military procurement, *Contracts, *Supervisors, Weapon systems, Department of Defense, Job analysis, Management planning and control.
Identifiers: Recommendations, Definitions.

The objective of the study was to recommend definitions of the roles of Department of Defense procuring contracting officers (PCOs) as they pertain to their assigned missions in weapon system acquisition. It has been concluded that broad interpretation of the role of the contracting officer, as an individual separate from the program manager (PM) of a major defense system, is incompatible with the authority and responsibilities of the program manager (PM). The report discusses the role, authority, responsibilities, and organizational location of the PCO in the program management environment. Some recommendations are made. (Modified author abstract)

AD-780 815/7GA PC$4.50/MF$1.45
Mcdonnell Douglas Corp St Louis Mo
JOB REQUIREMENTS OF G2 AIR AND IMAGE INTERPRETATION PERSONNEL.
Final rept. Dec 70-Feb 72,
Edward W. Youngling, Robert A. Vecchiotti, Edwin W. Bedarf, and Robert T. Root. May 74, 127p ARI-RR-1181
Contract DAHC19-71-C-0010

Descriptors: *Aerial reconnaissance, *Job analysis, *Army personnel, Officer personnel, Surveillance, Management planning and control, Images, Requirements.
Identifiers: *Image interpretation.

The purpose of this effort was to determine the tasks, duties, and associated procedures of G2 air and image interpretation personnel. The effort served to identify problems in the current Army air intelligence system, and requirements of new systems that necessitate training modifications. Data were collected using a comprehensive literature review, in-depth interviews with knowledgeable Army personnel, and mailed questionnaires sent to various Army aerial surveillance and reconnaissance units around the world. (Modified author abstract)

AD-780 869/4GA PC$10.50/MF$1.45
Stanford Research Inst Menlo Park Calif
EFFECTIVENESS OF THE MODERN VOLUNTEER ARMY ADVERTISING PROGRAM,
D. Ackerman, W. Mason, H. Vollmer, A. Baker, and R. Davis. Dec 71, 147p
Contract DAHC15-71-C-0306

Descriptors: *Recruiting, *Enlisted personnel, *Mass media, *Army personnel, Personnel development, Careers, Public relations, Commercial communications.
Identifiers: Publicity, All volunteer armed forces.

The review of the Army's paid broadcast-media recruitment advertising of Spring 1971 analyzes the effort in terms of its objectives, its planning, the media and advertisements it used, the audiences to whom it was addressed, its interrelationship with the person-to-person recruiting efforts of the Army, and its administration or execution. Additionally, this review compares the Army's Spring 1971 advertising with previous recruitment advertising of the Army and discusses the American societal environment at the time the advertising was aired. Finally, this review develops the Institute's findings and conclusions on the effectiveness of the Spring 1971 Army recruitment advertising and presents the Institute's recommendations as they might apply to future Army advertising programs' planning and execution. (Modified author abstract)

AD-780 961/9GA PC-GPO/MF$1.45-NTIS
Assistant Secretary of Defense (Manpower and Reserve Affairs) Washington D C
THE GUARD AND RESERVE IN THE TOTAL FORCE: A BIBLIOGRAPHIC SURVEY OF THE GUARD AND RESERVE.
Mar 74, 298p
Availability: Paper copy available from GPO $2.30 as SN-0800-00200.

Descriptors: *National guard, *Military reserves, *Bibliographies, Military forces(United States), Manpower utilization, Policies, Volunteers, Per-

sonnel management, Recruiting, Military training, Officer personnel, Technicians, Classification, Army, Air Force, Coast Guard, Marine Corps, Navy.
Identifiers: Reserve Officers Training Corps.

The combined pressures of national defense needs and contemporary manpower trends have resulted in the emergence of new concepts of how best to defend the United States and what the make-up of the military services should be. This volume offers an insight into the mission, role, organization, and readiness of the guard and reserve in the total force policy.

AD-781 034/4GA PC$3.00/MF$1.45
Air Force Human Resources Lab Brooks AFB Tex
A NEW METHOD FOR LONG RANGE FORECASTING OF F TYPE PCS (PERMANENT CHANGE OF STATION) MOVES OF AIRMEN.
Final rept. May 71-Sep 73,
Richard B. Williams. Feb 74, 14p Rept no. AFHRL-TR-74-1

Descriptors: *Air Force personnel, *Deployment, *Forecasting, Long range(Time), Methodology, Air Force budgets, Mathematical models, Regression analysis, Systems analysis.
Identifiers: Recommendations, Permanent change of station.

The report describes a new regression forecasting model and associated operational methodology for the prediction of the annual Air Force requirement of airman F type PCS moves. The results of a five year test are presented as an evaluation of predictive effectiveness of the model. A recommendation is made to implement the new model and methodology to improve the accuracy of the Air Force PCS budget and as a basis for further model development and testing. (Author)

AD-781 035/1GA PC$3.00/MF$1.45
Air Force Human Resources Lab Brooks AFB Tex
OPTIMAL ASSIGNMENT OF AIR FORCE PILOTS.
Final rept.,
Robert E. Miller. Feb 74, 20p Rept no. AFHRL-TR-73-59

Descriptors: *Air Force personnel, *Pilots, *Deployment, *Manpower utilization, Optimization, Air Force training, Discriminate analysis, Tactical Air Command, Mission profiles, Classification, Test methods, Performance(Human), Efficiency.
Identifiers: Pilot assignments.

The study addresses the problem, posed by Tactical Air Command, of whether a pilot on completion of undergraduate pilot training can be optimally assigned to a particular type of aircraft or mission. The problem was approached by using peer ranks to identify pilots of above average competence in each of three specialties. Using only these pilots as subjects, a multiple discriminant analysis was performed to yield a system for identifying a unique assignment for each pilot. The system uses ten test scores and training grades to classify a new pilot as optimally assignable to a transport, fighter, or reconnaissance aircraft or mission. The peer ranking was found to be predictable, and pilots acutally assigned in accordance with their optimal assignments were shown to be better pilots, as measured by the peer ranking, than pilots not optimally assigned. (Modified author abstract)

AD-781 036/9GA PC$3.00/MF$1.45
Air Force Human Resources Lab Brooks AFB Tex
REGRESSION PREDICTION OF AIRMAN E TYPE PCS (PERMANENT CHANGE OF STATION) MOVES.
Final rept. May 71-Sep 73,
Richard B. Williams. Feb 74, 13p Rept no. AFHRL-TR-74-2

Descriptors: *Air Force personnel, *Deployment, *Personnel management, Mathematical prediction, Regression analysis, Cost analysis, Air Force budgets, Mathematical models, Errors, Forecasting.
Identifiers: Permanent change of station.

The report describes a new regression forecasting model and associated operational methodology for the prediction of the annual Air Force requirement of airman E type PCS moves. The results of a four year test are presented as an evaluation of predictive effectiveness of the model. A recommendation is made to implement the new model and methodology to improve the accuracy of the Air Force PCS budget and as a basis for further model development and testing. (Author)

AD-781 041/9GA PC$3.00/MF$1.45
Air Force Human Resources Lab Brooks AFB Tex
DEVELOPMENT AND FEASIBILITY TEST OF A METHOD TO STUDY LOCATION ASSIGNMENT PREFERENCES OF AIRMEN.
Interim rept. 1 Sep 72-28 Feb 74,
Thomas C. Tuttle, William L. Brockhaus, and Joe T. Hazel. Apr 74, 16p Rept no. AFHRL-TR-74-40

Descriptors: *Personnel management, *Air Force personnel, Human factors engineering, Social psychology, Deployment, Job satisfaction, Feasibility studies, Geographic areas, Regression analysis, Questionnaires, Environments, Surveys, Analysis of variance.
Identifiers: *Assignment systems, *Preferences, Location.

The study evaluated the feasibility of an approach to investigate geographic location preferences of airmen. Two preference ratings were obtained from 509 basic airmen for each of 150 Air Force locations, one based on the location name, then unnamed, based on a 22 variable environmental profile description. Findings indicated the approach was feasible; that considerable variance was revealed across both individuals and locations; that the base selected variables could explain a considerable proportion of the rating variance through regression analysis. Further study of location preferences of experienced personnel is recommended. (Author)

AD-781 042/7GA PC$9.00/MF$1.45
Florida State Univ Tallahassee Computer-Assisted Instruction Center
THE ANALYSIS AND DEVELOPMENT OF AN ADAPTIVE INSTRUCTIONAL MODEL(S) FOR INDIVIDUALIZED TECHNICAL TRAINING - PHASE I,
Duncan N. Hansen, Bobby R. Brown, Paul F. Merrill, Robert Tennyson, and David B. Thomas. Aug 73, 116p AFHRL-TR-72-50(I)
Contract F33615-72-C-1277

Descriptors: *Computer aided instruction, *Individualized training, Instructional materials, Courses(Education), Training, State of the art, Reviews.

Shrinking training budgets pose a serious problem to those confronted with the present and future challenge of providing competent Air Force technicians for increasingly technical positions in a modern Air Force. One promising solution to this problem has been to harness the capabilities of the computer as an instructional training device. To be cost-effective, computer-based instruction must maximize individual student attainment of training objectives, while simultaneously minimizing training time and costs. Adaptive Instructional Models (AIM) constitute the means by which effective training can be accomplished with a minimum expenditure of student time and instructional resources. The report describes the purpose and function of AIM. Additionally, seven adaptive instructional models, to include supporting literature, have been analyzed and recommendations as to model application in Air Force technical training courses have been made. (Author)

COM-74-11073/5GA PC$14.25/MF$1.45
Macro Systems, Inc., Silver Spring, Md.
EVALUATION OF THE OCCUPATIONAL TRAINING INFORMATION SYSTEM (OTIS).
Final rept.
May 74, 222p EDA/OER-74-248

Descriptors: *Industrial management, *Personnel development, Education, Industrial training, Manpower utilization, Labor relations, Standards, Forecasting, Economic development, Kentucky, Oklahoma.

MACRO Systems, Inc., under contract to the Economic Development Administration, evaluated the operations and effectiveness of the Occupational Training Information System (OTIS) under development in Kentucky, aided by an EDA Technical Assistance grant, and operational for several years in Oklahoma. The nucleus of the multiple subsystem OTIS is the interface between occupational demand, provided by employer forecasts, and potential employee supply, reported by vocational educators and other state personnel. This information is needed on a substate and short-term (one and two year) basis for planning effective vocational education programs.

COM-74-11128/7GA PC$5.00/MF$1.45
Chicago Univ., Ill. Dept. of Economics.
UNEMPLOYMENT EFFECTS OF RESTRICTING CHICAGO GROWTH.
Research rept.
John Hekman. Dec 72, 36p Urban Economics-85
EDA/OER-74-260
Grant EDA-OER-393-G-71-13

Descriptors: *Employment measures, *Illinois, Unemployment rate, Standard metropolitan statistical areas, Projections, Labor migration, Demand changes, Urban growth, Constraining, Measurement.
Identifiers: *Chicago(Illinois).

A study pursued the limited goal of measuring the expected unemployment cost of a reduction in city size which is initiated by a cut in labor demand. The other approach would have been that of inducing population to move and measuring the cost of having their jobs follow them. The study also restricts itself to a broad method of reduction in labor demand of a flat 10% cut in the intire Chicago SMSA. The alternative of reducing certain industries, for example those which cause the most pollution, would involve questions of input-output coefficients and skill mix. The scope of this study is primarily the migration response of the population given a certain reduction in labor demand.

COM-74-70067/5GA PC-GPO
Bureau of the Census, Washington, D.C.
1970 OCCUPATION AND INDUSTRY CLASSIFICATION SYSTEMS IN TERMS OF THEIR 1960 OCCUPATION AND INDUSTRY ELEMENTS,
John A. Priebe, JoanHeinkel, and Stanley Greene. Jul 72, 75p Technical Paper-26
Library of Congress Catalog Card no. 72-600175.
Paper copy available from GPO $0.65 as C3.212:26.

Descriptors: *Occupational surveys, *Occupational classifications, *Industrial surveys, United States, Census tabulations, Comparative studies, Interactions, Sector changes, Statistical analysis, Employment surveys.

The report is designed to aid data-users in comparing 1970 and 1960 census data by quantifying the inter-relationships between the 1970 and 1960 occupation and industry classification systems. The 1970 and 1960 occupational and industrial classifi-

cation systems are listed. The 1970 classification systems reflect the revisions made to improve the systems and to provide more detailed information on the industry and occupation of persons. The two major tables in the report provide derivations of 1970 occupation and industry categories from the 1960 occupational and industrial classification system. Text tables present summaries of estimated changes among major occupation groups and among major industry groups in the 1960 experienced labor force because of changes in census classification between 1960 and 1970.

COM-74-70073/3GA PC-CENSUS
Bureau of the Census, Washington, D.C.
INVESTIGATION OF CENSUS BUREAU INTERVIEWER CHARACTERISTICS, PERFORMANCE, AND ATTITUDES: A SUMMARY,
Gail Poe Inderfurth. Jun 72, 35p Working Paper-34
Library of Congress Catalog Card no. 72-600144.
Paper copy available from Bureau of the Census, Washington, D. C. 20233. $0.50.

Descriptors: *Professional personnel, *Census, Interviews, Personnel selection, Personality, Attitudes, Sociopsychological surveys, Performance evaluation, Reviews, Research needs.
Identifiers: *Interviewers.

The report summarizes work done in the Census Bureau in the area of investigation of interviewer characteristics, attitudes, and performance. Information is presented on the following: characteristics of Census Bureau interviewer; performance in relation to characteristics; performance in general, with an analysis of production and quality; interviewers' attitudes and opinions about their work and training; turn-over rates; areas of application; and future research. A bibliography and a glossary of terms are also included.

N74-22606/9GA PC$4.50/MF$1.45
Kanner (Leo) Associates, Redwood City, Calif.
ESTABLISHMENT OF THE ACADEMY OF SCIENCES IN RUSSIA.
B. V. Levshin. May 74, 27p NASA-TT-F-15575
Contract NASW-2481
Tran-Transl. Into English from Priroda (Moscow), No. 1, Jan. 1974 p 6-24.

Descriptors: *Histories, *Science, *U.s.s.r., Culture (Social sciences), Education, Politics.

For abstract, see STAR 1213

PB-232 896/1GA PC$5.50/MF$1.45
West Virginia Div. of Vocational Rehabilitation, Charleston.
COORDINATION OF VOCATIONAL REHABILITATION AND DEPARTMENT OF WELFARE ACTIVITIES.
Final rept.,
William R. Phelps. Aug 71, 49p
Contract SRS-25-65224

Descriptors: *Vocational training, *Rehabilitation, *West Virginia, Training projects, Social welfare, Public assistance, Program review, Feasibility, Cooperation, Reviews, Services, Joint operations.
Identifiers: *Vocational rehabilitation, *Disabled persons, Demonstration projects, *Charleston(West Virginia), *Beckley(West Virginia).

The publication is a final report on a vocational rehabilitation services project which attempted to reveal the values to be achieved by close association of the Division of Vocational Rehabilitation and the Department of Welfare in the areas of demonstration, service, and staff training in order to better serve clients of the Department of Welfare. The project was able to strengthen the area of staff training on a cooperative basis between the two agencies, and was able to refine reporting procedure with regard to financial expenses. An improved system of referrals, cases excepted, and cases closed rehabilitated occurred as a result of this joint effort.

PB-232 927/4GA PC$8.00/MF$1.45
Riverside City Personnel Dept., Calif.
THE VALIDATION OF ENTRY-LEVEL LAW ENFORCEMENT EXAMINATIONS IN THE STATES OF CALIFORNIA AND NEVADA,
Stephen Wollack, John J. Clancy, and Stephen Beals. Sep 73, 99p RCPD-EEOS-73-002
Prepared by Selection Consulting Center, Sacramento, Calif.

Descriptors: *Aptitude tests, *Law enforcement, Qualifications, Performance standards, Job analysis, Employment.

The report describes a study which developed police officer job analysis and job performance information which was used to develop two new entry-level law enforcement exams to be tested for job-relatedness and equal employment opportunity. The exams were administered to 396 Whites, 41 Blacks, and 53 persons with Spanish-surnames. The final analysis of the study concludes that these examinations are related to police officer positions in the participating jurisdictions and their proper use comports with governmental guidelines on testing and selection.

PB-232 945/6GA PC$8.50/MF$1.45
Virginia Div. of State Planning and Community Affairs, Richmond.
NORTHERN VIRGINIA POLICE AND FIRE VALIDATION AND TEST REVISION PROJECT FOR ENTRANCE LEVEL POLICE OFFICERS AND FIRE FIGHTERS.
Final rept.,
Henry F. Hubbard. Jul 73, 416p USCSC-72-VA-01(7)-36
Contract USCS-72-VA-01(7)

Descriptors: *Police, *Fire fighting, Qualifications, Personnel, Employment, Tests, Evaluation, Requirements, Job analysis, Virginia.
Identifiers: Fairfax County(Virginia), Prince William County(Virginia), Arlington County(Virginia), Alexandria(Virginia).

The report documents in detail a project which focused on improving selection procedures for the positions of police officer and fire fighter in four jurisdictions in Northern Virginia. The project was carried out in 11 steps or phases, dealing with the following areas: (1) task analysis, (2) qualification requirements, (3) applicant counseling, (4) examination sites, (5) preparation of tests and related materials, (6) training, (7) consideration of various kinds of validity, (8) qualification requirements and employment methods used in other jurisdictions, (9) job performance criteria, (10) study of relevant court decisions, and (11) revision of tests and related studies. The report describes in step-by-step fashion what was done, why it was done, and the results and consulting firm's recommendations. New selection devices were developed and tested as a part of the project, but are not included for security reasons. The consultants' assessment of other, existing test materials is included in the report.

PB-232 950/6GA PC$4.50/MF$1.45
Iowa Univ., Iowa City. Inst. of Public Affairs.
HANDBOOK FOR PREPARING JOB CLASSIFICATIONS.
Final rept.,
John C. Thomas. 1973, 120p USCSC-73-IA-01C-30
Contract USCSC-73-IA-01C

Descriptors: *Job analysis, *Management guidelines, *Handbooks, Management information systems, Planning, Classifications, Compatibility, Federal policies, Occupations.
Identifiers: *Job descriptions.

The document provides detailed guidance in how to develop job classification plans. It gives information on the use of job analysis to prepare individual job descriptions, and explains how related, individual jobs are then grouped into classes. Special emphasis is placed on the development of job descriptions which will facilitate selection using methods that do not conflict with Federal EEO laws and regulations. Sample classifications and individual job descriptions are provided in the areas of clerk, clerk-typist, clerk-steno, secretary, receptionist, cashier, account clerk, key punch operator, switch-board operator, meter reader, parking meter repairperson, subprofessional engineers, and others.

PB-232 963/9GA PC$3.25/MF$1.45
New Mexico Univ., Albuquerque. Criminal Justice Program.
SPANISH LANGUAGE TRAINING FOR POLICEMEN -- LESSONS LEARNED DURING A FIRST ATTEMPT,
Steven Gonzales. 4 Mar 74, 26p CJP-74-02
Contract LEAA-73-NI-06-0002

Descriptors: *Spanish language, *Personnel development, Police, Education, Evaluation.
Identifiers: Second language learning.

The report contains a description of a Spanish language training project for cadets and officers in the Albuquerque Police department and recommendations for similar projects. The purpose of the project was to improve communication between policemen and non-English speaking residents. Cadets were required to take an introductory class while officers volunteered for both the introductory class and the intermediate class. A total of thirty three cadets and sixty five officers enrolled. Thirteen cadets and thirty five officers finished the course with a grade of C or better. In a questionnaire completed by fewer than half of those who finished the course, thirteen said they had learned to converse in Spanish and ten said they had not. Twenty of those responding said the course would assist them in future relationships with Spanish speaking residents. (Modified author abstract)

PB-233 055/3GA PC$3.25/MF$1.45
Minnesota State Dept. of Personnel, St. Paul.
EMPLOYEE PERFORMANCE APPRAISAL (A SUPERVISOR'S MANUAL).
Final rept.
Jan 74, 37p USCSC-73-MN-05C-24
Contract USCSC-73-MN-05C

Descriptors: *Performance evaluation, *Government employees, *State government, *Minnesota, Supervision, Manuals, Management guidelines, Job analysis, Performance standards, Personnel development.
Identifiers: *Supervisors manuals, *Job descriptions.

The document consists of three separate guides; one on writing position descriptions, one on developing standards of performance, and one on conducting performance appraisal sessions. Also included are guidelines on how to use the employee performance appraisal system and a set of worksheets for use in implementing the system. The primary purpose of the employee performance appraisal system is employee development.

PB-233 057/9GA PC$3.75/MF$1.45
National Commission on Productivity. Washington, D.C.
MANAGING HUMAN RESOURCES IN LOCAL GOVERNMENT: A SURVEY OF EMPLOYEE INCENTIVE PLANS.
Final rept.,
John Greiner. Oct 73, 58p* USCSC-73-DC-NIPA-26, NCP-73-001.
Contract USCSC-73-DC-NIPA

Descriptors: *Incentives, *Productivity, Awards, Bonuses, Participative management, Payment,

Work time standards, Punishment(Psychology), Performance standards, Personnel development, Motivation.

The booklet, prepared by the Urban Institute for the National Commission on Productivity, provides information on incentive plans that have been tried by local governments. Such programs have considerable potential for improving both government productivity and employee job satisfaction. Incentives are discussed, categorized by type, and considerations for implementing and evaluating incentive programs are outlined. Specific illustrations of incentive programs in the following areas are provided: (1) Supervisory and management personnel, (2) nonsupervisory personnel, (3) citywide incentives, (4) law enforcement, (5) sanitation, (6) public works, (7) fire, (8) health and welfare, (9) education, (10) parks and recreation, and (11) miscellaneous services and functions.

PB-233 173/4GA PC$6.50/MF$1.45
Geomet, Inc., Rockville, Md.
THE TEAM DESCRIPTION, MANPOWER UTILIZATION AND CHARACTERISTICS OF FAMILY HEALTH WORKERS.
Final rept. 1 Jul 72-30 Jun 73,
G. Edward McEvoy, Jean L. Corley, and E. Elizabeth Ewing. Jan 74, 273p GEOMET-HF-298 BHSR-74-43
Contract OEO-B2C-5383

Descriptors: *Public health, *Family relations, *Social welfare, *Professional personnel, Manpower utilization, Community relations, Centers, Training programs, Nurses, Economic gains, Evaluation, Personnel development.
Identifiers: *Family health workers, Practical nurses, *Home care services.

A report is made of the findings from a study of family health workers and OEO- and HEW-assisted comprehensive health centers. Six centers were intensively studied in selected areas of the study. Generally, findings indicate that Family Health Worker (FHW) training programs have provided jobs for community residents and have helped upgrade their education; most centers do not practice in a coordinated team mode; and FHW utilization is mixed. However, there is a lack of consistent role definition. Where the FHW is used for such home care, the cost of physician visits saved can more than offset the costs for the FHW. Another finding was that practical nurses are not adequately used.

PB-233 320/1GA PC$3.00/MF$1.45
Human Resources Research Organization, Alexandria, Va.
FOR THE TECHNICAL COMMUNICATOR: PURSUING PROFESSIONAL IDENTITY AND MATURITY,
Eugene A. Cogan. May 74, 9p HumRRO-PP-8-74
Presented at the International Technical Communications Conference (21st) St. Louis, Mo., May 74.

Descriptors: *Telecommunication, *Technology development, *Professional personnel, Concepts, Services, Reference groups, Predictions, Training needs, Reviews, Personnel development.
Identifiers: *Professions, *Technical communication.

The concept of technical communication as a profession is examined. Discussion of the attributes of such a profession centers around the services provided, the characteristics of the individual, and the characteristics of the group. Groups similar in origin and state of professionalization to technical communication are also discussed. Six prescriptions and four proscriptions are offered as basic guidelines. The author projects that this profession will continue to evolve and prosper; will gradually assume more of the trappings of older, established professions; and, will become a more highly specialized and technical field requiring specialized and technical training.

PB-233 321/9GA PC$3.00/MF$1.45
Human Resources Research Organization, Alexandria, Va.
HIGHER EDUCATION AND THE CHALLENGE OF THE SEVENTIES,
David S. Bushnell. Jun 74, 15p HumRRO-PP-9-74
Presented at the Strategies for Change and Knowledge Utilization Conference, Saratoga Springs, N.Y., Jul 72.

Descriptors: *Education, *Universities, Revisions, Training needs, Management guidelines, Predictions, Problem solving, Objectives, Constraints, Resources, Management methods, Concepts, Participative management, Systems engineering.
Identifiers: *Curriculum development, *Higher education.

In light of the new demands being made on higher education in the seventies, a six-step systematic change strategy is presented to implement needed reforms in educational institutions. The approach requires (a) recognition of an existing problem; (b) establishment of well-defined, assessable goals and objectives; (c) identification of constraints and needed resources; (d) selection and evaluation of alternative solutions; and (e) implementation of the selected procedure or practice. The author argues for combining the concept of systematic problem solving with the modern management strategies of participative management.

TT-73-53000/01 PC$3.75/MF$1.45
Office of Education, Washington, D.C.
SELECTED BIBLIOGRAPHY OF EDUCATIONAL MATERIALS IN PAKISTAN. VOLUME 7, NUMBER 1, 1973. PERIOD COVERED JANUARY-MARCH 1973.
1973, 54p
The above journal is translated on a regular basis. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: *Education, *Pakistan, *Bibliographies, Adults, Children, Females, Objectives, Planning, Tests, Schools, Classifications, Languages, Instructors, Books, Policies.
Identifiers: Curricula.

A bibliography on educational materials in Pakistan contains abstracts on adult, child, higher, science, teacher, technical, and women's education; educational goals, planning, philosophy, psychology, and methods; examinations, libraries, problems, and textbooks.

5J. Psychology (Individual and Group Behavior)

AD-780 562/5GA PC$3.25/MF$1.45
Civil Aeromedical Inst Oklahoma City Okla
ADAPTATION TO VESTIBULAR DISORIENTATION. XII. HABITUATION OF VESTIBULAR RESPONSES: AN OVERVIEW,
William E. Collins. Mar 74, 40p FAA-AM-74-3
See AD-704 471.

Descriptors: *Vestibular apparatus, *Space perception, Humans, Semicircular canals, Vertigo, Habituation learning, Response(Biology), Reviews, Aerospace medicine, Laboratory animals, Stress(Physiology), Stress(Psychology), Experimental data.
Identifiers: Spacial disorientation.

Vestibular and visual mechanisms are critical sensing systems in spatial orientation and in spatial disorientation. In aviation or space environments in particular, the role of the vestibular system is central to the problems of spatial disorientation and 'pilot's vertigo.' A question of significant concern in this regard has been centered around the possibility of abolishing or reducing undesired vestibular responses (inaccurate experiences of motion and eye movements which could blur vision) by repeated exposure to appropriate stimulus conditions. The present report reviews research conducted on this question. The review is generally restricted to activity and responses from the semicircular canals of the vestibular system. Methodological problems are presented briefly and the influence of arousal on vestibular responses is detailed. Data obtained from animals and from man are treated separately. (Modified author abstract)

AD-780 789/4GA PC$3.75/MF$1.45
Syracuse Univ N Y
THE ROLE OF SELECTED ORGANIZATIONAL VARIABLES IN LEARNING FROM WRITTEN INSTRUCTION.
Final rept. 1 Sep-31 Dec 73,
John F. Carter, and Carol Carrier. May 74, 63p
Rept no. TR-74-31 NPRDC-TR-74-31
Contract N00953-74-M-C044

Descriptors: *Reading, *Learning, *Memory(Psychology), Recall, Aptitudes, Training.
Identifiers: *Comprehension.

Improvements in the readability of Navy textual material obviously depends upon such traditional factors as word and sentence length. It would seem reasonable, however, that if text is to be readable, but also learnable and recallable, factors relating to how the ideas in the text are organized will be important. Two experiments investigated the recall of text with different organizational schemes, read differing numbers of times, by high and low verbal ability trainees. Inferences for both educational practice and research are drawn from these findings. (Modified author abstract)

AD-780 794/4GA PC$3.75/MF$1.45
Carnegie-Mellon Univ Pittsburgh Pa Graduate School of Industrial Administration
ATTITUDES AFFECTING TURNOVER OF NAVY CIVILIAN EMPLOYEES.
Technical rept.,
Clarence Curry. Mar 74, 53p
Contract N00014-67-A-0314-0012
Mathematical and Conversational Computer Models for Manpower Planning Project Report No. 2.

Descriptors: *Industrial relations, *Attitudes(Psychology), Correlation techniques, Naval research, Civilian personnel, Factor analysis, Regression analysis, Job satisfaction, Policies, Labor unions, Employee relations, Organization theory, Reviews.
Identifiers: *Labor turnover.

Survey data of employee attitudes from a large sample of U. S. Navy civilian employees are examined for links with employee turnover. Factor analysis is used to reduce the data to a smaller set of underlying variables. Regression analysis is then used to explore the relationship between turnover and attitudinal factors, organization size and time. Factors found to be significantly connected with turnover include employee services, satisfaction with subordinates, policy toward subordinates, union management relations, and job satisfaction/morale. (Author)

AD-780 806/6GA PC$3.25/MF$1.45
American Univ Washington D C Dept of Psychology
SIMILARITY OF ATTITUDE, INTERPERSONAL ATTRACTION, AND SELECTIVE EXPOSURE TO INFORAMTION.
Technical rept.,
Philip H. Sullivan, and Elliott McGinnies. Jun 74, 34p Rept no. TR-4
Contract N00014-68-A-0245-0004

Descriptors: *Attitudes(Psychology), *Test methods, *Reaction(Psychology), Social communication, Social psychology, Psychological tests, Performance(Human).
Identifiers: *Selective exposure, *Interpersonal attraction.

Two experiments were conducted to determine whether initially favorable impressions would lead to subsequent exposure to counterattitudinal arguments. In the first experiment, designed as a pilot-study, military subjects were exposed to tape-recorded communications from two speakers who advocated positions either supportive or nonsupportive of the subjects' beliefs. It was expected that measures of attraction would be more positive for speakers whose opinions agreed with the subjects'. It was found that the establishment of favorable impressions led to more time spent listening to the more-liked communicator, despite his advocation of an incongruent opinion. College students were used in the second experiment with slightly modified procedures. (Modified author abstract)

AD-780 812/4GA PC$3.75/MF$1.45
Bunker-Ramo Corp Arlington Va
RESEARCH ON TACTICAL MILITARY DECISION MAKING: APPLICATION OF A DECISION PREDICTION CONCEPT IN A SIMTOS ENVIRONMENT.
Technical paper,
James E. Robins, Louis Buffardi, and Thomas G. Ryan. Mar 74, 63p ARI-Technical paper-246
Contract DAHC19-71-C-0001

Descriptors: *Decision making, *Military operations, *Performance(Human), *Psychological tests, Predictions, Test methods, Computer applications, Information systems, Army research.
Identifiers: Scenarios, Predictors.

An experiment was conducted to determine whether predictors of decision quality established in a prior experiment--based on academic achievement and information processing strategy--maintained their effectiveness in a defensive planning scenario incorporating a fully computerized information retrieval capability. A test scenario for defensive planning was developed and administered individually to 20 senior field grade officers. Each officer planned a division defense, in sector, against an expected attack by two mechanized infantry aggressor divisions. Nine predictors selected in a prior experiment were included in the analysis. Four predictors are discussed which maintained substantial predictive stability. (Modified author abstract)

AD-780 814/0GA PC$3.00/MF$1.45
Army Research Inst for the Behavioral and Social Sciences Arlington Va
NUMERICAL ENCODING OF QUALITATIVE EXPRESSIONS OF UNCERTAINTY.
Edgar M. Johnson. Dec 73, 25p ARI-Technical paper-250

Descriptors: *Information processing, *Performance(Human), *Intelligence, *Psychological tests, Ratings, Uncertainty, Accuracy, Probability, Army personnel, Students, Army research, Numerical analysis, Clustering, Test construction(Psychology).

Judgment of the probable accuracy of intelligence data and products is held as integral to the intelligence rating process. Accurate communication of the probability of uncertainty implicit in such judgment is requisite to the effective production and utilization of intelligence. Twenty-eight subjects, 14 U. S. Army enlisted men and 14 extension college students, numerically encoded on a 0 to 100 scale each of 15 probability phrases in each of three sentence contexts. Subjects were relatively consistent in their own encoding of given phrases, but differed, often radically, from other subjects. Cluster analysis of the numbers assigned by subjects indicated an underlying asymmetric probability scale comprised of a small number of intervals. (Modified author abstract)

AD-780 823/1GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
THE INFLUENCE OF EXERCISE UPON THE SPEED OF RESPONDING IN A RECOGNITION TASK.
A. K. Osinitskii. 7 Jun 74, 13p Rept no. FTD-HC-23-1735-74
Edited trans. of mono. Psikhologicheskie Voprosy Regulyatsii Deyatelnosti, Moscow, 1973 p198-206.

Descriptors: *Information processing, *Performance(Human), *Reaction time, Psychological tests, Training, Personnel development, Modification, Utilization, Recognition, Translations, USSR.
Identifiers: *Task performance, *Recognition tasks.

A discussion is made of the dependence of response time upon the informative rate of a signal which undergoes considerable changes as the degree of performance exercise changes.

AD-780 830/6GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
BIOELECTRICAL CORRELATES OF OPERATIVE ADJUSTMENT.
E. M. Rutman, and V. K. Muldarov. 7 Jun 74, 11p
Rept no. FTD-HC-23-1738-74
Edited trans. of mono. Psikhologicheskie Voprosy Regulyatsii Deyatelnosti, Moscow, 1973 p87-94.

Descriptors: *Bioelectricity, *Psychophysiology, *Electroencephalography, *Motor reactions, Brain, Electrophysiology, Response(Biology), USSR, Translations.

The research task was the clarification of the following questions: Does operative adjustment manifest itself in the characteristics of the induced potentials and in which ones specifically; is operative adjustment reduced solely to the nonspecific creation of a definite level of activation in correspondence to the expected activity, or does one observe selective displacements in the individual functional systems; which displacements are linked with the forthcoming activity and which assure their best execution with the minimal activation. Research methodology and results are discussed.

AD-780 933/8GA PC$7.00/MF$1.45
Naval Postgraduate School Monterey Calif
CONCERNING VISUAL DETECTION OF MOVING PERSONNEL TARGETS.
Master's thesis,
Michael Selvitelle. Mar 74, 78p

Descriptors: *Personnel detection, *Visual perception, *Target recognition, Moving targets, Military requirements, Test methods, Performance(Human), Target acquisition, Models, Standards, Military research, Probability, Environments, Theses.

The detection of moving personnel targets by individual soldiers is a complex process. The thesis examines variables that affect the acquisition process and how these variables are currently being modeled for analysis. A well-controlled experiment is analyzed to assist in establishing guidelines for future research in this area. The guidelines establish field experiment procedures, as well as the available probability distributions associated with target detection processes. (Modified author abstract)

AD-780 953/6GA PC$3.75/MF$1.45
Perceptronics Inc Woodland Hills Calif
ADAPTIVE COMPUTER AIDING IN DYNAMIC DECISION PROCESSES. PART I. ADAPTIVE DECISION MODELS AND DYNAMIC UTILITY ESTIMATION.
Semi-annual technical rept. no. 4, 1 Oct 73-1 Apr 74,
Amos Freedy, Richard Weisbrod, Kent Davis, Donald May, and Gershon Weltman. 1 May 74, 64p Rept no. PTR-1016-74-5(I)
Contract N00014-73-C-0286, ARPA Order-2347
See also Part 2, AD-780 246.

Descriptors: *Decision making, *Man machine systems, Interactions, Computer applications, Mathematical models, Adaptive systems, Command and control systems.

The report describes the implementation of a system for adaptive computer aiding in dynamic decision processes and provides theoretical background for some of the underlying techniques. The report is presented in two parts under separate covers. Part I, 'Adaptive Decision Models and Dynamic Utility Estimation,' includes (1) a description of the adaptive decision model for the decision task; (2) a presentation of the concept of dynamic utility and a technique, based on machine learning principles, for adaptive on-line estimation of these utilities; (3) a description of the overall system and software; and (4) the overall objectives and approach for an experimental program involving the system. (Modified author abstract)

AD-780 971/8GA PC$3.25/MF$1.45
Oregon Research Inst Eugene
'I KNEW IT WOULD HAPPEN' -- REMEMBERED PROBABILITIES OF ONCE-FUTURE THINGS.
Technical rept.,
Baruch Fischhoff, and Ruth Beyth. May 74, 26p
Rept no. Research Bull-Vol-14-4-73
Contract N00014-73-C-0438, ARPA Order-2449
Prepared in cooperation with Hebrew Univ., Jerusalem (Isarel).

Descriptors: *Forecasting, *Probability, *Performance(Human), Questionnaires, Recall, Psychological tests, Accuracy.
Identifiers: Prediction accuracy, Judges.

Judges who had estimated the likelihood of various possible outcomes of President Nixon's trips to Peking and Moscow were unexpectedly asked to remember, or reconstruct in the event that they had forgotten, their own predictions some time after the visits were completed. In addition, they indicated whether or not they thought that each event had in fact occurred. Remembered-reconstructed probabilities are discussed. In their original predictions, subjects appear to have overestimated low probabilities and underestimated high probabilities, although they were generally accurate. Judging by their reconstructed-remembered probabilities, however, subjects seldom perceived having been very surprised by what had or had not happened. These results are discussed in terms of cognitive 'anchoring' and possible detrimental effects of outcome-feedback. (Modified author abstract)

AD-780 976/7GA Reprint
Navy Medical Neuropsychiatric Research Unit San Diego Calif
INTERACTION OF REM DEPRIVATION AND STAGE 4 DEPRIVATION WITH TOTAL SLEEP LOSS: EXPERIMENT 2.
Laverne C. Johnson, Paul Naitoh, Julie M. Moses, and Ardie Lubin. 1974, 16p Rept no. NMRU-73-22

Descriptors: *Rapid eye movement in sleep, Sleep, Electroencephalography, Nervous system, Psychophysiology, Performance(Human).
Identifiers: *Sleep deprivation, Sleep stages.

To determine whether prior deprivation of stage REM or stage 4 sleep would potentiate the effects of total sleep loss, seven young adult males were denied rapid eye movement (REM) sleep and seven were denied stage 4 sleep for three nights

before one night of total sleep loss. Measures of autonomic and electroencephalogram (EEG) activity, mood, anxiety, Rorschach Concept Evaluation Test (CET) and on several performance tasks were obtained during baseline, following stage deprivation, total sleep loss and during recovery. There were no marked changes in any area following three nights of stage REM and stage 4 deprivation. The changes following total sleep loss were similar for both groups. Prior deprivation of stage REM or stage 4 did not potentiate sleep loss effects. (Modified author abstract)

AD-781 033/6GA PC$3.00/MF$1.45
Air Force Human Resources Lab Brooks AFB Tex
RELATIONSHIPS AMONG AN INDIVIDUAL INTELLIGENCE TEST AND TWO AIR FORCE SCREENING AND SELECTION TESTS.
Final rept. Feb 72-Jul 73,
David F. McGrevy, Stephen B. Knouse, and Ronnie A. Thompson. Mar 74, 17p Rept no. AFHRL-TR-74-25

Descriptors: *Psychological tests, *Intelligence, *Air Force personnel, Manpower utilization, Minorities, Aptitude tests, Ethnic groups, Analysis of variance, Reviews, Statistical analysis.
Identifiers: All volunteer armed forces, Armed Forces qualification test, Airman qualifying examination, Black white comparisons.

With the implementation of the all volunteer force concept, the Air Force must insure that the objectively measurable range of ability in its manpower pool is being utilized. This is especially true for minority groups who have been categorized and channeled into military career areas based upon their performance on two selection tests: the Armed Forces Qualification Test (AFQT) and the Airman Qualifying Examination (AQE). To investigate the relationship of the AFQT and AQE to the general mental ability of different racial groups of airmen, a sample of 100 black and 100 white Air Force basic trainees was administered an established test of general mental ability, the Wechsler Adult Intelligence Scale (WAIS). The verbal, performance, and full scale IQ scores of the white and black airmen were compared to their AFQT scores and their four AQE aptitude indexes. Significant differences between black and white airmen were found on the AFQT, the four AQE aptitude indexes, and the three WAIS IQs. Regression analyses demonstrated most differences to be interaction effects between race and Air Force test scores. Implications for further research into Air Force airmen selection tests were discussed. (Author)

N74-21707/6GA PC$4.00/MF$1.45
Kanner (Leo) Associates, Redwood City, Calif.
CHANGES IN CEREBRAL CIRCULATION INDUCED BY HYPNOTIZATION OF THE RABBIT BY THE IMMOBILIZATION METHOD.
I. T. Demchenko, and P. I. Paykin. Apr 74, 14p
NASA-TT-F-15520
Contract NASW-2481
Tran-Transl. Into English from Zh. Vysshei Nervnoi Deyatel'Nosti (Moscow), V. 21, No. 5, Sep. 1971 p 1006-1011.

Descriptors: *Brain circulation, *Hypnosis, *Hypodynamia, *Immobilization, *Rabbits, Blood flow, Blood vessels, Electrophysiology, Neurophysiology, Vasoconstriction.

For abstract, see STAR 1213

N74-21742/3GA PC$4.75/MF$1.45
Scientific Translation Service, Santa Barbara, Calif.
RESULTS OF MEDICAL AND BIOLOGICAL STUDIES PERFORMED DURING THE GEMINI AND APOLLO PROGRAMS: CHANGES IN THE WORKING CAPACITY OF THE ASTRONAUTS.
Z. I. Kopanev, and Y. M. Yuganov. Apr 71, 34p
NASA-TT-F-15503
Contract NASW-2483
Tran-Transl. Into English from Izv. Akad. Nauk Sssr, Ser. Biol. (Ussr), No. 1, 1974 p 5-20.

Descriptors: *Astronaut performance, *Psychophysiology, *Space flight stress, *Work capacity, Aerospace medicine, Apollo flights, Biological effects, Gemini flights, Human reactions, Literature, Manned space flight.

For abstract, see STAR 1213

PB-232 854-T/GA PC$4.00/MF$1.45
National Institutes of Health, Bethesda, Md. Translation Unit.
SOME NEURODYNAMIC MECHANISMS OF MEMORY,
A. R. Luriya, E. N. Sokolov, and M. Klimkovskii. 10 Jun 74, 12p NIH-74-245C
Trans. of Zhurnal Vysshei Deyatelnosti (USSR) v17 n2 p195-202 1967.

Descriptors: *Memory, Learning transfer, Neural transmission, Conditioned responses, CNS disorders, USSR, Translations.

Modal-specific disorders of amnestic processes were established during investigation of local lesions of the auditory analyzer. It was determined that dynamic disorders of memory do not lead to damping of trace. Two different mechanisms of dynamic disorders were determined by a number of experimental procedures: accumulation of inhibition in the system of new connections and 'stimulus equalization' of new and old connection as a result of constricting the dynamic range of stimulation.

PB-233 060/3GA PC$3.00/MF$1.45
Pennsylvania State Civil Service Commission, Harrisburg. Div. of Research and Special Projects.
UPTIGHT ABOUT CIVIL SERVICE TESTS.
Final rept.
1973, 19p USCSC-73-PA-NIPA-32

Descriptors: *Civil Service, *Test construction(Psychology), *Handbooks, Information, Public relations, Classifications, Objectives, Methodology, Pennsylvania.
Identifiers: Difficulty levels.

A public information booklet is distributed to individuals who apply to take written tests administered by the State Civil Service Commission, Commonwealth of Pennsylvania explains why tests are given, what kinds of tests are used, how hard the tests are, how written tests should be taken, and how to mark the answer sheet. It includes a sample of what the test booklet cover page looks like and sample general aptitude test questions.

5K. Sociology

AD-780 538/5GA PC$5.00/MF$1.45
Center for Naval Analyses Arlington Va
ECONOMIC ANALYSIS OF THE INTRACITY DISPERSION OF CRIMINAL ACTIVITY,
Michael W. Smith, and Ronald A. Schrimper. Jun 74, 40p Rept no. CNA-Professional Paper-120

Descriptors: *Criminology, *Urban areas, Statistical distributions, Economics, Mathematical models, Theory, Social psychology, Behavior, Flow, Statistical processes.
Identifiers: *Economic analysis.

The paper presents a model developed to explain crime flows between the areas of a city, an empirical implementation of this model, and some interpretations of the findings.

COM-74-11186/5GA PC$4.50/MF$1.45
Information Concepts, Inc., Arlington, Va.
DETERMINATION OF THE NUMBER OF COMMERCIAL AND NON-COMMERCIAL RECREATIONAL BOATS IN THE U.S., THEIR USE, AND SELECTED CHARACTERISTICS.
Final rept. Jul-Dec 73,
Kenneth M. Bromberg. 28 Dec 73, 118p* NOAA-74051407
Contract NOAA-3-35490

Descriptors: *Boats, *Recreational use, *Commercial fishing, Statistical data, Classifications, Statistical distributions, Fishes, Salt water, Revenue, Seasons.
Identifiers: Sport fishing.

Findings are summarized in tabular form under the following headings: Estimated number of private recreational boats by size class and region; Estimated number of private recreational boats that fish in salt water; Estimated number of trips and the corresponding number of days spent in salt water; Species of fish sought as a percent of total area fishing trips; Estimated number of commercial salt water sport fishing vessels by region and size class; Estimated number of trips and days spent in different kinds of salt water by commercial sport fishing; Species of fish sought by commercial sport fishing vessels expressed as a percent of total area fishing trips; Estimated annual gross revenue of commercial salt water sport fishing vessels by region and size class; Estimated number of trips and days spent in different kinds of salt water by commercial sport fishing; Species of fish sought by commercial sport fishing vessels expressed as a percent of total area fishing trips; and Estimated annual gross revenue of commercial salt water sport fishing vessels by size class.

COM-74-70064/2GA PC-GPO
Bureau of the Census, Washington, D.C.
INDEX TO 1970 CENSUS SUMMARY TAPES,
Paul T. Zeisset. Mar 73, 218p
Paper copy available from GPO $2.60 as C3.233:Su6/970/Ind.

Descriptors: *Population census, *Census, *Indexes(Documentation), Tables(Data), Data tapes, Stratification.

The index is a reference guide to 1970 census summary tape documentation and includes tabulations from all six 'counts' of summary data. The report is divided into two sections, A and B. Data from the First Count through the Fifth Count are indexed in section A; data from the Sixth Count are indexed in Section B. A cross-reference guide is also included in the index. The index lists abbreviated census tables descriptions, alphabetized by subject matter or stratifier. Each stratifier is listed, followed by the number of categories which appear in that stratifier.

COM-74-70068/3GA PC-GPO
Bureau of the Census, Washington, D.C.
SAMPLING APPLICATIONS OF THE 1970 CENSUS PUBLICATIONS, MAPS, AND PUBLIC USE SUMMARY FILES,
Margaret Gurney. May 72, 18p Technical Paper-27
Paper copy available from GPO $0.25 as C3.212:27.

Descriptors: *Census, *Data sampling, Urbanized areas, Standard metropolitan statistical areas, Maps.

The document provides information on the ways in which 1970 census publications, maps, and public use summary files can be used in the development of sampling frames for household surveys. Suggestions are presented for the use of census materials to design and select samples for three types of areas: urbanized areas, or cities within urbanized areas; standard metropolitan statistical areas (SMSA's); and States. An appendix describes in detail an example of a sample design which might be used for a household survey in a city located in an urbanized area for which Census block data are available.

COM-74-70070/9GA PC-GPO
Bureau of the Census, Washington, D.C.
SCIENTIFIC AND TECHNOLOGICAL DEVELOPMENT ACTIVITIES OF THE BUREAU OF THE CENSUS,
Bryan Hargis, and Donald Larson. Sep 73, 21p
Technical Paper-29
Paper copy available from GPO $0.55 as C3.212:29.

Descriptors: *Data processing, *Census, *Populations, Vital statistics, Computer programming, Special purpose computers, Statistical analysis, Demography, Sampling, Data recording.

The paper covers a wide range of research and development activities at the Bureau of the Census, and describes the major contributions of the Bureau in the collection and processing of statistical information. The text discusses the three areas of development profoundly influencing data collection and processing techniques: probability sampling; response error evaluation and control; and electronic data processing. A description of the Bureau's role in the basic developments of the theory of sample surveys and in the use of mechanical and electronic equipment is included along with a more detailed discussion on the Bureau's leadership in sampling and electronic data processing applications. Also included in this paper is a survey of the organization of research and development activities at the Bureau of the Census, and its impact on statistical programs and related activities throughout the United States and in other countries.

COM-74-70071/7GA PC-CENSUS
Bureau of the Census, Washington, D.C.
PRETESTS AND DRESS REHEARSALS OF THE 1970 CENSUS OF POPULATION AND HOUSING: A PROCEDURAL HISTORY,
Frederick G. Bohme. Feb 72, 32p Working Paper-32
Paper copy available from Bureau of the Census, Washington, D.C. 20233. $0.50.

Descriptors: *Census, *Population census, *Housing census, Surveys, Data sampling, Questionnaires.

The report describes each of the pretests and dress rehearsals conducted between 1961 and 1968 in preparation for the 1970 Census of Population and Housing. These activities were designed to test new data-collection techniques, to perfect the format and wording of questionnaires and instructional materials, and to further develop methods of improving coverage, as well as to test some of the programs for data processing and geographic identification of the census results.

COM-74-70072/5GA PC-CENSUS
Bureau of the Census, Washington, D.C.
AN ESTIMATE OF A QUASI-STABLE AGE-SEX DISTRIBUTION FOR GHANA IN 1960,
Peter Gardiner. Apr 72, 30p Working Paper-33
Library of Congress Catalog Card no. 72-600001.
Paper copy available from Bureau of Census, Washington, D.C. 20233. PC$0.50.

Descriptors: *Population census, *Ghana, *Population distribution, Population estimates, Age, Sex.

The report is an attempt to estimate a realistic age-sex distribution for Ghana based on the results of the 1960 census. The paper provides an analysis of the age-sex structure, a discussion on the applicability of quasi-stable population analysis as a means of estimating the age-sex structure in 1960, and an attempt to make an estimate of a quasi-age-sex structure by projecting a stable population estimated for 1948 forward 12 years incorporating assumptions of constant fertility and declining mortality.

COM-74-70075/8GA PC-CENSUS
Bureau of the Census, Washington, D.C.
RESPONSE VARIANCE IN THE CURRENT POPULATION SURVEY,
Benjamin J. Tepping, and Katherine L. Boland.
Sep 72, 28p Working Paper-36
Paper copy available from Bureau of the Census, Washington, D.C. 20233. $0.50.

Descriptors: *Population census, *Census, Tables(Data), Variance(Statistics), Standard deviation.

The report provides estimates of the interviewer's contribution to the variance of unbiased estimates of various totals based on the Current Population Survey. Section I of the report provides an introduction to response variance studies conducted as part of the previous decennial censuses; Section II shows the mathematical model; Section III describes the processing; and Section IV discusses the results on interviewer variance. Tabular data on the estimates of the average ratio over 6 months and an estimate of the standard deviation of each estimate is included along with charts showing the ratio of the correlated response variance to sampling variance.

COM-74-70077/4GA PC-CENSUS
Bureau of the Census, Washington, D.C.
POPULATION AND HOUSING INQUIRIES IN U.S. DECENNIAL CENSUSES, 1790-1970,
Frederick G. Bohme, Carol Donnelly, and Ann Drees. Nov 73, 187p Working Paper-39
Library of Congress Catalog Card no. 73-600280.
Paper copy available from Bureau of the Census, Washington, D.C. 20233. PC$2.50.

Descriptors: *Population census, *Housing census, *Census, *Residential buildings, Tables(Data), Socioeconomic status.

The report presents data collection forms and summary charts of questions on population and housing from the decennial censuses since 1790. These inquiries reflect the changing interests and information needs of the government and its people, including: a strong emphasis on detailed personal facts about the handicapped and the institutional population in the nineteenth century; concerned with housing, employment, and income during more recent decades; and, in the last two censuses, special attention to place of work and means of transportation to work. The changing content of the censuses is shown through charts which display for ready reference the topics covered in each census. These trends are also revealed through reproductions of the principal data collection forms so that the exact wording of the questions may be examined and compared. The report also contains a brief census history and bibliography.

PB-232 505/8GA PC$3.00/MF$1.45
Commercial Service Systems, Inc., Van Nuys, Calif.
STATISTICAL ANALYSIS OF MERCHANDISE LOSSES BY SHOPLIFTING.
Final rept.,
R. K. Griffin. 8 May 74, 17p*
This report is also contained in PB-232 506.

Descriptors: *Shoplifting, Commercial buildings, Law enforcement, Statistical analysis, Juvenile delinquency.

A comprehensive survey on shoplifting was taken during 1973, based on 17,876 actual apprehensions in supermarkets, drug stores and discount stores. Six hundred and seventy-five supermarkets from 16 companies contributed 14,790 data cases. The multi-state survey includes findings on shoplifting age groups, apprehensions, theft rates, value of articles recovered, prosecution rates, time data, and recommendations for parental involvement. This report is also contained in PB-232 506.

PB-232 506/6GA PC$4.75/MF$1.45
Commercial Service Systems, Inc., Van Nuys, Calif.
SURVEY AND ANALYSIS OF SHOPLIFTING DATA FROM 1964 TO 1973.
Final rept.,
R. K. Griffin. Jun 74, 126p*
See also PB-232 505.

Descriptors: *Shoplifting, *Behavior disorders, Statistical analysis, Commercial buildings, Shopping centers, Sales management, Urban areas, Surveys, Law.

Statistical analysis is given of eleven yearly surveys: An Analysis of Shoplifting in Supermarkets-1963; A view of Shoplifting in the Affluent Society-1964; Shoplifting: A Moral Dilemma-1965; The Shoplifter: Shadow or Substance-1966; Unpublished data-1967 (Statistics only); Shoplifting in Supermarkets: An Objective Survey-1968; A Factual Study of Shoplifting in Supermarkets-1969; Modern Shopping Centers: The Shoplifter in Paradise-1970; Unpublished data-1971 (Statistics only); Shoplifting: One Reason for High Prices-1972; Shoplifting: Crime of the Young-1973. Studies are a comparison of male-female, adult-juvenile, and juvenile male-juvenile female activity. The report includes percentage apprehended, time of day, day of week, and month apprehensions occurred; shows sex and age groups, kinds of merchandise stolen, method of concealment, average number of articles recovered, and average value of merchandise recovered. Drug stores, discount stores, and supermarkets contributed 140,000 data cases.

PB-232 944/9GA PC$33.25/MF$1.45
California State Dept. of the Youth Authority, Sacramento.
THE VOLUNTARY SELECTION OF DRUG TREATMENT PROGRAMS PROJECT.
Final rept.
1973, 604p
Grant LEAA-NI-71-107-PG

Descriptors: *Drug addiction, Policies, Populations, Projects, California, Demographic surveys, Questionnaires, Attitudes, Law enforcement.
Identifiers: *Drug treatment programs, Drug users, Drug pushers.

A study was made of twenty-one community based drug treatment programs in California. The study based on interviews with clients and staff, was divided into three segments: a survey of criteria used by outside evaluators to evaluate drug treatment programs, a survey of law enforcement attitudes and policy toward drugs, drug users, and drug dealers, and an intensive investigation of what types of drug users are found in what types of drug treatment programs. The methodology and results of the two surveys are found in the appendixes. The methods used in the actual program fieldwork are found in the first chapter and following chapters are devoted to program descriptions, detailed characteristics of clients found at specific types of programs, selected characteristics of clients themselves, and comparison group characteristics. The results in each chapter are summarized, and preferred and undesirable client profiles are given for specific program elements. (Modified author abstract)

PB-232 961/3GA PC$3.25/MF$1.45
New Mexico Univ., Albuquerque. Criminal Justice Program.
PREVENTION/REHABILITATION PROGRAMS AND THE BLACK COMMUNITY,
C. Becknell, and J. Goldsmith. 30 Jan 74, 42p CJP-74-01
Contract LEAA-73-NI-06-0002

Descriptors: *Correctional services planning, *Rehabiliation, *Negroes, Alcoholism, Drug addiction, Community relations, Probation, Effectiveness, New Mexico.
Identifiers: Albuquerque(New Mexico).

Results are presented of a survey of ninety Black residents and eighteen prevention/rehabilitation

agencies in Albuquerque, New Mexico. The purpose of this study was to determine whether these agencies were meeting the needs of the local Black community and to discover ways in which these programs could be of better service. (Modified author abstract)

PB-233 027/2GA PC$4.75/MF$1.45
Department of Housing and Urban Development, Washington, D.C. Policy Development and Research.
IMPLICATIONS OF SHORT-TERM FUNDING OF HOUSING REVENUE SHARING,
Donald Gogel, and Robert Alexander. 15 Jul 73, 31p HUD-PDR-401-b
Discussion Memo Prepared for the Housing Policy Task Force Team 4. Prepared by McKinsey and Company, Inc., New York.

Descriptors: *Housing studies, *Revenue sharing, *Financial management, Economic factors, Subsidies, Loans, Renovation, Insurance.
Identifiers: *Housing and urban development research.

The study examines the economic and strategic implications of short term funding of housing revenue sharing. The topics discussed are: front end subsidies, direct loans, rehabilitation, tenant economic mix, insurance pools, increased powers for state housing finance agencies, producer subsidies and residual long-term contract authority.

PB-233 038/9GA PC$5.75/MF$1.45
Technical Education Research Centers, Inc., Champaign, Ill. Midwest Center.
ALCOHOL AND HIGHWAY SAFETY CURRICULUM WORKSHOPS FOR K-12 KEY PERSONNEL.
Final rept. 28 Jun 72-31 Jan 74,
V. E. Burgener. Feb 74, 207p DOT-HS-801 149
Contract DOT-HS-100-2-503

Descriptors: *Alcoholism, *Traffic safety, Education, Safety, Workshops.
Identifiers: *Alcohol education, Drinking drivers, Driver intoxication.

Ten regional workshops were held for local educational personnel in late 1972 and early 1973. Teams of educators were selected from innovative school districts and oriented to the use of alcohol and traffic safety curriculum materials centered on student concerns. Five hundred eighty-seven participants attended from forty-nine states and Puerto Rico. The materials and concepts were introduced to 14,293 teachers and 1,845 administrators by the 333 respondents to a follow-up instrument. Usage with students, estimated from the follow-up survey is placed at 94,000.

PB-233 052/0GA PC$13.25/MF$1.45
Florida Atlantic Univ., Boca Raton.
A HISTORY OF THE SEMINOLE AND MICCOSUKEE TRIBES, 1859-1970.
Ecological rept. (Final),10Harry A. Kersey, Jr.
Harry A. Kersey, Jr. 1971, 201p DI-SFEP-74-46
Contract BIA-K51C14200480

Descriptors: *American Indians, Socioeconomic status, History, Education, Indian reservations, Ethnopsychology, Sociology, Florida.
Identifiers: Seminole Indians, Miccosukee Indians.

A brief history of the Seminole and Miccosukee Tribes, 1859-1970 was developed as a logical starting point for studying contemporary Indian society in Florida. It explores the way in which social, political, economic, religious, and other factors led to the development of a unique Indian lifestyle. Chapters focus on Indian cultural development during five distinct periods: (1) The end of the Third Seminole War to the establishment of missions and government agencies; (2) the era of Indian interaction with missionaries, traders, and government agents; (3) Indian reaction to education and christian religion; (4) the establishment of Indian reservations in Florida; and (5) contemporary social, political, and economic development of the Seminole and Miccosukee Tribes. An extensive bibliography and footnotes are included with the report.

PB-233 376/3GA PC$3.25/MF$1.45
Nebraska Univ., Lincoln. Dept. of Psychology.
EVALUATIVE RESEARCH OF A COMMUNITY-BASED PROBATION PROGRAM,
Richard H. Moore, and David Levine. 1974, 48p
Grant LEAA-NI-71-055

Descriptors: *Juvenile delinquency, *Probation, *Counseling, Interpersonal relations, Behavior disorders, Courts, Adolescence, Rehabilitation, Nebraska.
Identifiers: Lancaster County(Nebraska).

The report presents a description of a volunteer probation counselor program involving the use of volunteer citizens in counseling relationships with youthful misdemeanant offenders. The program was conducted by the Lincoln-Lancaster, Nebraska, Municipal Court. The report contains a description of the essential features of the program including selection of probationers and volunteers. The effectiveness of the program is assessed by three classes of evaluative criteria--behavior, personality, and psychosocial. Performances of high-risk youthful misdemeanant offenders who were assigned randomly to either routine probation programming or Volunteer Probation Counselors are compared. A sample of low-risk youthful misdemeanant offenders assigned to routine probation programming were also studied. The relationships between successful volunteers and probationers is examined. A model of the successful Volunteer Probation Counselor (MODEL-VOL) is developed and its scientific value assessed by comparing predictions generated by the MODEL-VOL with measures of successful relationships.

PB-233 398/7GA PC$4.00/MF$1.45
Chicago City Dept. of Development and Planning, Ill.
CHICAGO STATISTICAL ABSTRACT, PART 1.
Final rept.,
Jerral T. Harper, James P. Curry, Robert Laine, Brad Rome, and Michael Dereng. Jul 73, 81p
CC/NIPC-0271-011-0773
See also Part 2, PB-233 399.

Descriptors: *Socioeconomic profiles, *Illinois, *Municipalities, Population census, Population characteristics, Housing studies, Socioeconomic status, Residential buildings, Census tabulations, Community structure, Statistical data, Ethnic groups.
Identifiers: *Chicago(Illinois), *Housing and urban development research.

The abstract contains a series of 29 data tables arrayed by different geographic areas of the city and presenting population, housing and related socioeconomic information derived from the 1970 Census. All major subelements of the project have been completed. It includes the basic data schedules summarizing the information on the community area level.

PB-233 399/5GA PC$17.00/MF$1.45
Chicago City Dept. of Development and Planning, Ill.
CHICAGO STATISTICAL ABSTRACT, PART 2.
Final rept.,
Jerral T. Harper, James P. Curry, Robert Laine, Brad Rome, and Michael Dereng. Jul 73, 860p
CC/NIPC-0271-012-0773
See also Part 1, PB-233 398.

Descriptors: *Socioeconomic profiles, *Illinois, *Census tabulations, *Municipalities, Statistical data, Community structure, Census tracts, Population and housing census, Ethnic groups, Occupational characteristics, Household characteristics, Residential buildings, Rental payments, Facilities, Employment, Income.
Identifiers: *Chicago(Illinois), *Housing and urban development research.

The abstract contains the basic tabular data arrayed at the census tract level with community area subtotals, and individual area maps showing census tracts.

6. BIOLOGICAL AND MEDICAL SCIENCES

6A. Biochemistry

AD-780 661/5GA Reprint
Naval Medical Research Inst Bethesda Md
THE DETERMINATION OF O2-DISSOCIATION CURVES IN HEMOGLOBIN SOLUTIONS WITH A LIQUID FLUOROCARBON O2-TRANSPORT SYSTEM.
Medical research progress rept. no. 3,
L. A. Kiesow, J. B. Shelton, and J. W. Bless. 19 Sep 73, 15p
Revision of report dated 30 Mar 73.
Availability: Pub. in Analytical Biochemistry, v58 n1 p14-24 Mar 74.

Descriptors: *Hemoglobin, *Oxygen, *Dissociation, Spectrophotometry, Fluorohydrocarbons, Volumetric analysis.
Identifiers: Spectroscopic analysis.

A rapid, dynamic method for the determination of O2-dissociation curves in hemoglobin solution is reported. The method uses liquid fluorocarbon as O2-carrying titrant and dual-wavelength spectrophotometry for the quantitation of oxyhemoglobin formation. It measures quantitative changes of the hemoglobin affinity for oxygen. (Author)

AD-780 835/5GA PC$3.00/MF$1.45
Edgewood Arsenal Aberdeen Proving Ground Md
EVALUATION OF M15/M18 ENZYME DETECTOR TICKET SYSTEM WITH LOW CONCENTRATIONS OF GB.
Technical rept. Apr-Nov 71,
Laura W. Schwartz, Michael T. Packard, Celestine T. Holmes, and Charles J. McDowell.
Jun 74, 19p Rept no. ED-TR-74018

Descriptors: *GB agent, *Gas detectors, Enzymes, Kits, Cholinesterase inhibitors, Sensitivity, Sampling.
Identifiers: Performance evaluation.

The objective of this investigation was to evaluate the enzyme ticket system in the M15A2 and M18A2 detector kits, using various types of exposure, for the detection of low concentrations of GB. The tickets met the requirements for the chemical agent detector kit (0.03 plus or minus 0.02 micrograms/l in less than 10 min). They were able to detect 0.02 micrograms/l by static exposure for 8 min. (Modified author abstract)

AD-780 848/8GA PC$3.00/MF$1.45
Army Medical Research Lab Fort Knox Ky
DISTRIBUTION OF PROGESTERONE AND ITS EFFECT ON HUMAN BLOOD DURING STORAGE.
Interim rept.,
Frank DeVenuto, and Sarah M. Wilson. 29 Mar 74, 14p Rept no. USAMRL-1092

Descriptors: *Blood preservation, *Progesterone, Methylene blue, Adenosine phosphates, Blood banks, Blood transfusion, Erythrocytes, Hormones, Osmosis, Biochemistry.

Erythrocytes, preserved with addition of progesterone to whole blood, maintain higher adenosine triphosphate levels, lower spontaneous

lysis, higher osmotic resistance and higher uptake of methylene blue throughout 42 days of storage when compared to red cells preserved without progesterone. The hormone appears to be in steady-state equilibrium between plasma and erythrocytes and the amount in the plasma is almost twice that present in the cells. After repeated saline extractions, about 10% of the total progesterone remains attached to the erythrocytes. Cell populations of low density (young cells) show high specific activity throughout the storage time investigated. (Author)

AD-781 058/3GA Not available NTIS
National Research Council of Canada Halifax (Nova Scotia) Atlantic Regional Lab
THE EFFECT OF ENVIRONMENT ON THE FREE AND HYDROSOLUBLE STEROLS OF 'MUCOR ROUXII,
S. Safe. 7 Aug 73, 6p NRC-13693
Availability: Pub. in Biochimica et Biophysica Acta, v326 p471-475 1973.

Descriptors: *Fungi, *Steroids, Cells(Biology), Biochemistry, Morphology(Biology), Environments, Canada.
Identifiers: *Mucor rouxii, Phycomycetes.

Examination of the sterols produced by Mucor rouxii showed significant variations in the relative amounts of free (i.e. lipid extractable) and bound sterols contained in the aerobic and anaerobic cells. The filamentous aerobic cells contained primarily free sterols with only small amounts of the bound material. The reverse situation was true for the yeast-like anaerobic cells in which over 75% of the total sterols were bound and were released only after treatment with methanolic KOH solution. Extensive examination of the sterol fractions revealed a number of different sterols present; in the aerobic cells ergosterol was the main sterol (approx. 85%) but in the anaerobic cells (i.e. oxygen limiting) the concentration of this component was considerable diminished (36.5%) with increased amounts of ergosta-5,7,24(28)-trien-3 beta-ol (37.0%), ergosta-5,7-dien-3 beta-ol and ergosta-7,22,24(28)-trien-3 beta-ol present. (Modified author abstract)

AD-781 062/5GA Not available NTIS
National Research Council of Canada Ottawa (Ontario) Div of Biological Sciences
SUPPORT-AIDED PEPTIDE SYNTHESIS - REGENERABLE POLYMERIC REAGENTS, RECENT DEVELOPMENTS,
R. E. Williams. 1973, 7p
Availability: Pub. in Unidentified Jnl., p434-439 1973.

Descriptors: *Peptides, *Polymers, Synthesis(Chemistry), Supports, Canada.

The report discusses the chemical role of polymer supports in the synthesis of peptides.

COO-3277-28 PC$4.00/MF$1.45
Johns Hopkins Univ., Baltimore, MD. (Usa).
ORIGIN OF BIOLUMINESCENCE AND THE OXYGENATION OF POLYNUCLEAR AROMATIC HYDROCARBONS.
H. H. Seliger. 1974, 18p
Contract AT(11-1)-3277

Descriptors: (*Condensed aromatics, *Oxygen additions), (*Luminescence, *Origin), Bacteria, Chemical reactions, Dna, Fishes, Fungi, Hydroxylase, Luciferase, Molecular biology, Nucleotides, Pyrimidines, Toxins.

For abstract, see NSA 30 01, number 02297.

IJS-R-616 PC$3.00/MF$1.45
Institut Jozef Stefan, Ljubljana (Yugoslavia).
THERMODYNAMICAL STUDIES OF COOPERATIVE OXYGEN BINDING BY HEMOGLOBIN.
S. Svetina. Sep 73, 12p

Descriptors: (*Hemoglobin, *Molecular structure), (*Oxygen, *Chemical reactions), Binding energy, Biochemical reaction kinetics, Biological models, Data, Thermodynamics.

For abstract, see NSA 30 01, number 02298.

JPRS-62038 PC$3.75/MF$1.45
Joint Publications Research Service, Arlington, Va.
PROTEIN FROM PETROLEUM,
N. K. Nadirov, and A. P. Popov. 20 May 74, 57p
Trans. of mono. Belok iz Nefti, Moscow, 1974 61p.

Descriptors: *Biosynthesis, *Proteins, *Petroleum products, Amino acids, Crude oil, Lysine, Alkanes, USSR, Translations, Yeasts, Bacteria, Fermentation, Industrial plants, Insecticides, Culture media, Process charting.

The report contains data on the industrial production of protein using the method of biosynthesis from petroleum hydrocarbons. Chapter titles include: The problem of synthetic protein; The microorganisms growing in petroleum components; Culture media for the growth of microorganisms; The production technology of obtaining protein from petroleum; The Novoufimskiy Plant - - first in industrial production of protein from oil; Characteristics of the protein-vitamin concentrate obtained; Microbiological production of amino acids, ferments, insecticides, and other substances from petroleum.

N74-21715/9GA PC$4.00/MF$1.45
Kanner (Leo) Associates, Redwood City, Calif.
COMPARATIVE STUDY OF THE EFFECTS OF SALTS ON FOUR ENZYMES FROM THE EXTREME HALOPHILE BACTERIA OF HALOBACTERIUM CUTIRUBRUM.
A. I. Higa, M. C. Vidal, and J. J. Cazzulo. May 74, 16p NASA-TT-F-15560
Contract NASW-2481
Tran-Transl. Into English from Anales Asoc. Quim. (Argentina), V. 61, 1973 p 291-300.

Descriptors: *Bacteria, *Enzyme activity, *Salts, *Stimulation, Activation (Biology), Biochemistry, Cations, Chlorides, Halophiles, Microorganisms.

For abstract, see STAR 1213

N74-21772/0GA PC$4.00/MF$1.45
Linguistic Systems, Inc., Cambridge, Mass.
THE CREATION OF A STABLE PH GRADIENT IN A NONELECTROLYTE BUFFER SOLUTION MIXTURE. THE USE OF THIS SYSTEM FOR THE ISOELECTRIC FOCUSING OF ALBUMIN AND HEMOGLOBIN.
G. V. Toritskiy, V. P. Zovyalov, and V. M. Abramov. Apr 74, 10p NASA-TT-F-15567
Contract NASW-2482
Tran-Transl. Into English from Dokl. Akad. Nauk. Ssr (Ussr), V. 214, No. 4.

Descriptors: *Albumins, *Buffers (Chemistry), *Hemoglobin, *Nonelectrolytes, *Ph factor, Dielectric properties, Electrophoresis, Focusing, Solvents.

For abstract, see STAR 1213

N74-21896/7GA PC$6.50/MF$1.45
Biospherics, Inc., Rockville, Md.
AUTOMATED MICROBIAL METABOLISM LABORATORY.
Quarterly Progress Report, 1 Oct. - 31 Dec. 1973.
28 Feb 74, 67p NASA-CR-138146
Contract NASW-2280

Descriptors: *Biochemistry, *Experimental design, *Microbiology, *Soils, *Test chambers, Carbon 14, Feasibility analysis, Mars environment, Sterilization, Substrates.

For abstract, see STAR 1213

ORO-2687-26 PC$4.25/MF$1.45
Florida State Univ., Tallahassee (Usa). Inst. Of Molecular Biophysics.
RESEARCH IN PHOTOSYNTHESIS. FINAL REPORT, MARCH 1, 1960--SEPTEMBER 30, 1972.
H. Gaffron. 1972, 21p
Contract AT(40-1)-1687

Descriptors: (*Photosynthesis, *Biochemical reaction kinetics), (*Photochemistry, *Research programs), Carbon dioxide, Catalysis, Enzymes, Metabolism, Oxidation, Reduction, Water.

For abstract, see NSA 30 01, number 02299.

PATENT-3 301 768 Not available NTIS
Department of Agriculture, Washington, D.C.
PROCESS FOR OBTAINING AMYLOGLUCOSIDASE.
Patent, *Filed 26 Oct 64, patented 31 Jan 67,
Karl L. Smiley. 31 Jan 67, 2p PAT-APPL-406 622,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Enzymes, *Glucosidases, Starches, Fermentation, Aspergillus.
Identifiers: PAT-CL-195-66, Glucosidases/dextrin, Aspergillus awamori.

The invention relates to the discovery that aerobic fermentations of Aspergillus awamori in a weakly acidic medium (pH 5.5) yields about 3 to 5 times as much amylogiucosidase per ml. of culture filtrate accompanied by very little, if any, of the objectionable transglucosidase that is also produced under the same conditions by Aspergillus niger.

PATENT-3 562 113 Not available NTIS
Department of Agriculture, Washington, D.C.
RAPID MICROBIOLOGICAL PRODUCTION OF ALPHA-GALACTOSIDASE.
Patent,
Sin itiro Kawamura, Tadasi Kasai, and Sumizo Tanusi. Filed 17 Jun 68, patented 9 Feb 71, 2p PAT-APPL-737 343,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Galactosidase, *Fermentation, *Escherichia coli, Biosynthesis, Bacteria, Purification, Sugar beets.
Identifiers: PAT-CL-195-66, Galactosides.

The patent concerns purified extracts of sonicated 4-8 hour cultures of Escherichia coli, subsp. communior, ATCC 7009; which provide very high yields of alpha-galactosidase that hydrolyzes raffinose and other alpha-galactosides. Raffinose seriously depresses the crystallization of sucrose from sugar beets, and much higher yields are expected if the galactoside is enzymatically hydrolyzed or otherwise eliminated.

PATENT-3 589 982 Not available NTIS
Department of Agriculture, Washington, D.C.
PRODUCTION OF L-ASPARAGINASE.
Patent, *Filed 1 May 69, patented 29 Jun 71,
Robert E. Peterson, and Alex Ciegler. 29 Jun 71, 3p PAT-APPL-821 107,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Erwinia, *Hydrogenomonas, *Enzymes, *Patents, Bacteria, Asparagine, Biosynthesis.
Identifiers: Erwinia aroideae, Hydrogenomonas eutropha, *Asparaginase, PAT-CL-195-66.

L-asparaginase is produced in high yield by culturing certain bacteria, namely, Erwinia aroideae or Hydrogenomonas eutropha. This invention relates to the production of L-asparaginase, and has for its prime object the provision of processes for preparing the said enzyme in yields higher than heretofore attainable.

SGAE-2221 PC$4.00/MF$1.45
Oesterreichische Studiengesellschaft fuer Atomenergie G.M.B.H., Seibersdorf. Inst. Fuer Biologie.
INFLUENCE OF PREDNISOLONEACETATE ON THE DNA SYNTHESIS OF CELLS OF SYNOVIAL FLUID IN PATIENTS WITH CHRONIC POLYARTHRITIS.
G. Klein, H. Altmann, R. Eberl, H. Broell, and A. Wottawa. Dec 73, 14p
In German.

Descriptors: (*Dna, *Biosynthesis), (*Prednisolone, *Biological effects), Acetates, Animal cells, Body fluids, Bone joints, Diseases, Patients.

For abstract, see NSA 30 01, number 02303.

UR-3490-392 PC$4.00/MF$1.45
Rochester Univ., N.Y. (Usa). Dept. Of Radiation Biology and Biophysics.
ISOLATION OF A SODIUM-SPECIFIC IONOPHORE FROM (NA EXP + + K EXP +)-ATPASE PREPARATIONS.
A. E. Shamoo. 1973, 39p CONF-731137-1

Descriptors: (*Atp, *Hydrolysis), (*Sodium ions, *Diffusion), (*Atp-ase, *Separation processes), Enzymes, Transport.

For abstract, see NSA 30 01, number 02289.

6B. Bioengineering

AD-780 660/7GA PC$3.75/MF$1.45
Florida Univ Gainesville Engineering and Industrial Experiment Station
QUANTITATIVE ANALYSIS OF THE PHYSIOLOGICAL CONDITION AND LEVEL OF ALERTNESS OF MAN IN AN ISOLATED ENVIRONMENT.
Final rept.,
Jack R. Smith. 1972, 74p AFOSR-TR-73-2322
Grant AF-AFOSR-2171-72

Descriptors: *Vigilance, *Electroencephalography, Quantitative analysis, Drugs, Monitors, Cats, Humans, Isolation, Computer programs, Environments, Pharmacology, Physiology.
Identifiers: *Alertness, Neurophysiology.

The research program concentrated on developing electronic detectors and software for monitoring the physiological condition and level of alertness in man and quantitatively analyzing cat electroencephalogram (EEG) in order to determine the effect of drugs on EEG activity.

N74-21740/7GA PC$7.50/MF$1.45
National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.
POWER SPECTRAL DENSITY ANALYSIS OF THE ELECTROMYOGRAM FROM A WORK TASK PERFORMED IN A FULL PRESSURE SUIT.
Ph.D. Thesis - Houston Univ.
E. V. Lafevers. May 74, 89p NASA-TM-X-58136, JSC-09004

Descriptors: *Electromyography, *Human factors engineering, *Muscular fatigue, *Power spectra, Aerospace medicine, Fatigue tests, Human body, Musculoskeletal system, Physical work, Space suits, Spectrum analysis.

For abstract, see STAR 1213

PATENT-3 815 582 Not available NTIS
Department of Health, Education, and Welfare, Bethesda, Md. Patent Branch.
MODULATED SINE WAVE FLOWMETER.
Patent,
William H. Schuette. Filed 23 Mar 72, patented 11 Jun 74, 6p PAT-APPL.-237 262,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Blood flow, *Flowmeters, *Patents, Electromagnetic radiation, Rheometers.
Identifiers: PAT-CL-128-2-5-F.

The invention relates to an electromagnetic flowmeter, and, more particularly, to an electromagnetic flowmeter for ionizable solutions such as blood. Undesirable quadrature signals are phased out of the signal channel by amplitude modulation thereby improving the reading as to the amount of flow.

PB-233 100/7GA PC$4.75/MF$1.45
National Inst. for Occupational Safety and Health, Cincinnati, Ohio.
AN INSTRUMENT FOR TESTING ISOMETRIC STRENGTH AND ENDURANCE.
Final rept.,
D. E. Wasserman, T. Germann, D. V. Goulding, and F. Pizzo. May 74, 33p DHEW/NIOSH-74-109, NIOSH-TR-211-74

Descriptors: *Physical fitness, *Fatigue(Biology), *Strength, Experimental design, Measuring instruments, Humans, Performance, Monitors, Test equipment, Muscles, Exercise(Physiology).

The report contains a technical description of a versatile instrumentation system designed to obtain, monitor, and process human static strength and isometric endurance data. The system includes in-house designed mechanical and electronic apparatus as well as commercially available apparatus. Examples of the system's use with human subjects are presented.

6C. Biology

AD-780 948/6GA PC$3.25/MF$1.45
Bowling Green State Univ Ohio Dept of Mathematics
ORIENTATION OF HOMING PIGEONS EXPOSED TO THE ELECTROMAGNETIC FIELDS AT PROJECT SANGUINE'S WISCONSIN TEST FACILITY.
Final rept. 1 Apr 73-29 Feb 74,
Louis C. Graue. 1 Jun 74, 28p
Contract N00014-73-A-0419

Descriptors: *Pigeons, *Orientation(Direction), *Electromagnetic fields, Extremely low frequency, Deflection, Antennas, Electric fields, Geomagnetism, Global communication systems.
Identifiers: Sanguine project, *Homing pigeons.

Homing pigeons were released at the intersection of two antennas to home to their loft in Bowling Green, Ohio 800 km away. Pigeons were also released at several places in the Test Site area to home to their loft located at the intersection of the two antennas. It appears that the birds may be deflected toward an energized antenna and may orient faster in the presence of ELF fields. (Modified author abstract)

COM-74-11080/0GA PC$4.00/MF$1.45
South Dakota Dept. of Game, Fish and Parks, Pierre.
SONAR USE IN LOCATING FISH AGGREGATIONS FOR COMMERCIAL SEINING UNDER THE ICE, 1970-1973, SOUTH DAKOTA.
Final rept. Oct 70-Jun 73,
Donald C. Warnick. Apr 74, 16p NOAA-74051647
Report on Application of Sonar to Fish Detector Techniques to Increase Annual Production.

Descriptors: *Fresh water fishes, *Fishing, *Sonar equipment, Commercial fishing, Lakes, Ice, Statistical data, Carp, South Dakota.
Identifiers: Seining, Cyprinus carpio, Ictiobus cyprinellus.

Sonar was used to locate fish aggregations to define the potentially good haul areas, and eliminate unproductive seining during January, February and March of 1971, 1972, and 1973. Seine catch rates for Lake Poinsett for carp (Cyprinus carpio) and bigmouth buffalofish (Ictiobus cyprinellus) collectively averaged 13.9 thousand pounds for the above three years during which an average of 37 seine hauls were made. The average winter catch was 514.3 thousand pounds for the three years that sonar was used, 57% greater than the 333.9 thousand pounds average for the preceding eight years of seining. (Modified author abstract)

COM-74-11143/6GA PC$3.75/MF$1.45
Arkansas Univ., Fayetteville. Dept. of Zoology.
EFFECTS OF QUALITY AND QUANTITY OF FOOD ON GOLDEN SHINER 'NOTEMIGONUS CRYSOLEUCAS' PRODUCTION. PART 2. EFFECTS OF QUALITY OF FOOD (PROTEIN LEVEL) AND STOCKING DENSITY ON GROWTH, TEMPERATURE TOLERANCE AND PRODUCTION O F GOLDEN SHINER ('NOTEMIGONUS CRYSOLEUCAS').
Final rept.,
Raj V. Kilambi, and Ralph B. Roseberg. 1974, 61p NOAA-74051401
Grant NMFS-2-162-R
See also Part 1, COM-74-11087.

Descriptors: *Fishes, *Feeding stuffs, *Aquaculture, Proteins, Growth, Tolerances(Physiology), Temperature, Light(Visible radiation).
Identifiers: Notemigonus crysoleucas, Bait fish.

Golden shiners were stocked at densities of 20, 28 and 36 fish per 60 gal. tank or 400, 600 and 800 lb/acre respectively while fed at 5% of their body weight. Six of the twelve groups were fed a 38% protein feed and the remaining six a 28% protein feed. The best growth (both length and weight) was achieved at the 20 fish at 38% protein feed condition. Since temperature, light, chemical factors and feeding rate were not allowed to vary, the differences in growth, production, and temperature tolerance were caused by the manipulation of the variables of protein level and stocking density. The 20 fish per tank (400 lb/acre) density at 38% protein level was concluded to be the most favorable condition for successful commercial culture of golden shiners.

COM-74-11282/0GA PC$20.00/MF$20.00
National Technical Information Service, Springfield, Va.
SPORT FISHING. A BIBLIOGRAPHY WITH ABSTRACTS.
Rept. for 1964-Jun 74,
Edward J. Lehmann. Jul 74, 139p* NTIS-WIN-74-059

Descriptors: *Fishing, *Recreation, *Bibliographies, Recreational facilities, Boats, Estuaries, Management planning, Regulations, Ice, Policies, Fishing grounds, Marine fishes, Fresh water fishes, Water pollution, Fish economics, Reefs.
Identifiers: *Sport fishing.

The bibliography contains 124 selected abstracts of research reports retrieved using the NTIS on-line search system--NTISearch. The reports cited cover all aspects of recreational fishing. This includes studies on planning, citizen attitudes, government policies, development of artifical reefs, regional economics, and management techniques.

COM-74-50546/2GA PC-GPO/MF$1.45-NTIS
National Marine Fisheries Service, Washington, D.C. Div. of Statistics and Market News.
FISHERIES OF THE UNITED STATES, 1973.
Current Fishery Statistics,
B. G. Thompson. Mar 74, 113p* NOAA-NMFS-CFS-6400 NOAA-74051646

Paper copy available from GPO $1.50 as C55.309/2:6400.

Descriptors: *Fishing industry, *Fish economics, *Fishing products, Shellfish, Marine fishes, Seafood, Frozen food, Food processing, Exports, Prices, International trade, Statistical data, Value, Employment, Food consumption, United States.
Identifiers: Catch statistics.

The U.S. commercial harvest of fish, shellfish, and other aquatic life in 1973 was 4.7 billion pounds worth a record $907.4 million to the fishermen. The landings improved slightly compared with 1972, and the value increased 29%--principally because of higher exvessel prices. The average value in 1973 was a record 19.2 cents per pound. The slight gain in landings was caused principally by record harvests of anchovies, Pacific shrimp, surf clam meats, and snow crabs. Increased landings of bonito, Atlantic cod, croaker, Pacific sea herring, striped bass, pollock, rockfishes, scup, and whiting also contributed to the greater volume. The domestic shrimp industry was the most valuable fishery in the country. In 1973, as in the two previous years, landings for human food were smaller than the quantity taken for industrial products. The value of fishery products processed in the U.S. from both domestic and imported raw materials was a record $2.8 billion - 25% more than in 1972.

COO-1300-35 PC$4.00/MF$1.45
Wisconsin Univ., Madison (Usa).
ORGANIZATION OF THE R CHROMOSOME REGION IN MAIZE. ANNUAL REPORT OF RESEARCH.
J. L. Kermicle. Jan 73, 11p
Contract AT(11-1)-1300

Descriptors: (*Maize, *Chromosomes), Comparative evaluations, Gene mutations, Pigments, Regional analysis, Stability, Variations.

For abstract, see NSA 30 01, number 02295.

JPRS-62150-1 PC$6.00/MF$1.45
Joint Publications Research Service, Arlington, Va.
WHALES AND DOLPHINS. PART I,
A. V. Yablokov, V. M. Belkovich, and V. I. Borisov. 4 Jun 74, 247p
Trans. of mono. Kity i Delfiny, Moscow, 1972 Chap-1 - Chap-9. See also Part 2, JPRS-62150-2.

Descriptors: *Whales, *Dolphins(Mammals), *Anatomy, Cetacea, Musculoskeletal system, Teeth, Digestive system, Respiratory system, Cardiovascular system, Blood, Eye(Anatomy), Urinary system, Food habits, Reproduction(Biology), Animal diseases, Translations, USSR.

The report contains a description of the functional anatomy of all vital systems of organs of Cetacea. A considerable part of the report deals with current studies of dolphins.

JPRS-62150-2 PC$6.75/MF$1.45
Joint Publications Research Service, Arlington, Va.
WHALES AND DOLPHINS. PART II,
A. V. Yablokov, V. M. Belkovich, and V. I. Borisov. 4 Jun 74, 286p
Trans. of mono. Kity i Delfiny, Moscow, 1972 Chap-10 - Chap-18 (Including Appendixes 1 and 2 and Bibliography. See also Part 1, JPRS-62150-1.

Descriptors: *Whales, *Dolphins(Mammals), *Anatomy, Cetacea, Musculoskeletal system, Teeth, Digestive system, Respiratory system, Cardiovascular system, Blood, Eye(Anatomy), Urinary system, Flood habits, Reproduction(Biology), Animal diseases, Translations, USSR.

Contents:
Hearing and echolocation;
The eye and other sense organs;
Food and feeding;
Reproduction;
Distribution;
Behavior;
Age and growth;
Diseases, enemies, and parasites;
The origin o
f cetacea;
Systematics of cetaceans;
A standard system of methods for investigating cetaceans.

N74-21710/0GA PC$4.00/MF$1.45
California Inst. of Tech., Pasadena. Div. of Biology.
PHYSIOLOGY OF APLYSIA CALIFORNICA.
Final Technical Report, Jul. 1969 - Jun. 1973.
F. Strumwasser. 2 Nov 73, 11p NASA-CR-138149
Contract NGR-05-002-031

Descriptors: *Mollusks, *Nervous system, *Summaries, Abstracts, Biochemistry, Electrophysiology.

For abstract, see STAR 1213

ORO-4182-4 PC$4.50/MF$1.45
Howard Univ., Washington, D.C. (Usa).
DIFFERENTIAL GENE EXPRESSION IN NEUROSPORA CRASSA CELL TYPES. PROGRESS REPORT, FEBRUARY 1, 1973--MARCH 31, 1974.
S. K. Dutta. 1974, 30p
Contract AT(40-1)-4182

Descriptors: (*Neurospora, *Genetics), Biochemical reaction kinetics, Dna, Genes, Rna.

For abstract, see NSA 30 01, number 02301.

PB-232 992/8GA PC-GPO/MF$1.45-NTIS
Utah State Univ., Logan. Dept. of Wildlife Science.
EARLY LIFE HISTORY AND FEEDING OF YOUNG MOUNTAIN WHITEFISH.
Ecological research series rept.,
Clair B. Stalnaker, and Robert E. Grasswell. Jan 74, 56p EPA-660/3-73-019, W74-08832
Paper copy available from GPO $0.95 as stock no. EP1.23:660/3-73-019.

Descriptors: *Fresh water fishes, *Animal ecology, *Thermal pollution, *Logan River, Life cycles, Reproduction(Biology), Animal behavior, Mortality, Temperature, Aquaculture, Growth, Utah.
Identifiers: Prosopium williamsoni, Whitefish.

Early life history studies and development of culture methods of the mountain whitefish (Prosopium williamsoni) were conducted in the Logan River, and in the Utah State Research Laboratory and USU Fisheries Laboratory. Spawning was observed in the laboratory and the Logan River from mid-November to mid-December during dusk. At ambient river temperature from 1.7-6.1C eggs began hatching after 79 days and continued for 23 days. Total mortality to hatch of eggs from weekly collections from five areas was 92%. In the laboratory, at 7.2C eggs began hatching in 52 days and continued for 23 days; at 8.9C in 45 days and continued for 30 days. Larval whitefish from two areas showed differences in growth due to temperature experience. Growth was examined in the laboratory at 6, 9, and 12C. A simple linear model for predicting growth was developed.

TID-26560 PC$4.50/MF$1.45
Florida State Univ., Tallahassee (Usa).
CELL RESPONSE TO NUCLEIC ACID PENETRATION. PROGRESS REPORT, JULY 1, 1973--MARCH 15, 1974.
J. H. Stuy. 1974, 27p
Contract AT(40-1)-3885

Descriptors: (*Haemophilus, *Gene recombination), (*Dna, *Uptake), Adsorption, Bacteriophages, Depolymerization.

For abstract, see NSA 30 01, number 02304.

TT-73-54042 PC$3.00
Department of Agriculture, Washington, D.C.
AN ANALYSIS OF ANIMAL REMNANTS OCCURRING IN ANTHILLS OF FORMICA POLYCTENA FORST. (HYM., FORMICIDAE) (ANALIZA RESZTEK POCHODZENIA ZWIERZECEGO WYSTEPUJACYCH W MROWISKACH FORMICA POLYCTENO FORST. (HYM., FORMICIDAE)),
Jerzy Wisniewski. 1974, 7p
Trans. of Polskie Pizmo Entomologiczne, v37 n2 p385-390 1967, by Anatol Dangel. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: *Insects, *Poland, Sampling, Identifying, Coleoptera, Beetles, Diptera, Arthropoda, Lepidoptera, Forestry, Translations.

The purpose of the report is to determine the origin of the animal remains occurring in Formica polyctena Forst. anthills. As has been shown by earlier studies these remnants constitute an average of 0.02 percent by weight of the material making up the nest. The anthills from which samples were taken for analysis were found in pine stands of the Zielonka Experimental Forest Range located 15 km northeast of Poznan. No gradation of forest pest was observed over the last several years in this region, hence the collected material supplied some interesting data concerning the species composition of insects consumed during the period between gradations.

TT-73-54079 PC$3.00
Department of Agriculture, Washington, D.C.
DANGEROUS DISEASES OF THE POPPY PLANT (GROZNE CHOROBY MAKU),
Andrzej Fulara. 1974, 4p
Trans. of Ochrono Roslin (Poland) v12 n3 p16-17 1968, by Zdzislaw Markiewicz. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: *Plant diseases, *Poland, Plant viruses, Identifying, Translations.
Identifiers: Poppy plants.

The poppy plant can also be attacked by such dangerous diseases caused by viruses as virus icterus of the seed poppy and mosaic of the seed poppy plant. As these diseases are not very well known, a brief description of them is given.

TT-74-50018 PC$15.00/MF$1.45
National Science Foundation, Washington, D. C.
FUNDAMENTALS OF PALEONTOLOGY. VOLUME V. MOLLUSCA - CEPHALOPODA I NAUTILOIDEA, ENDOCERATOIDEA, ACTINOCERATOIDEA, BACTRITOIDEA, AMMONOIDEA (AGNOIATITIDA, GONIATITIDA, CLYMENIIDA),
Yu. A. Orlov, and V. E. Ruzhentsev. 1974, 895p
Trans. of mono. Osnovy Paleontologii, Moscow, 1962. A Manual for Paleontologists and Geologists of the USSR. Sponsored in part by National Science Foundation, Washington, D. C. Special Foreign Currency Science Information Program.

Descriptors: *Paleontology, *Manuals, *Cephalopoda, *Mollusca, Taxonomy, Ecology, Classification, Bibliographies, USSR, Translations.
Identifiers: Nautiloidea, Endoceratoidea, Actinoceratoidea, Bactritoidea, Ammonoidea, Agoniatitida, Goniatitida, Clymeniida.

Cephalopoda are described in two volumes in the series 'Fundamentals of Paleontology.' The

present volume covers a large part of the subclass Ectocochlia, namely, the groups which were formerly classed together under the name of Nautiloidea (Nautiloidea, Endoceratoidea, Actinoceratoidea, Bactritoidea) and also the Paleozoic Ammonoidea (the orders Agoniatitida, Goniatitida and Clymeniida). The second volume, published in 1958, is devoted to the Mesozoic Ammonoidea (the orders Ceratitida and Ammonitida) and the subclass Endocochlia. It also contains in the form of an appendix a description of the small class of Conicoconchiida.

UCB-34-P-156-X-6 PC$4.25/MF$1.45
California Univ., Berkeley (Usa). Dept. Of Biochemistry.
COMPREHENSIVE PROGRESS REPORT, FEBRUARY 1, 1971--JUNE 30, 1974.
B. N. Ames. 1974, 21p
Contract AT(04-3)-34

Descriptors: (*Mutagens, *Monitoring), (*Carcinogens, Monitoring), (*Salmonella typhimurium, *Sensitivity), Bacteria, Dna, Environment, Man, Mutations, Neoplasms, Pesticides, Somatic mutations.

For abstract, see NSA 30 01, number 02305.

UCRL-75520 PC$4.00/MF$1.45
California Univ., Livermore (Usa). Lawrence Livermore Lab.
SCANNING CYTOPHOTOMETRY: PRINCIPLES AND PRACTICE.
B. H. Mayall. 12 Mar 74, 16p CONF-731007-7

Descriptors: (*Animal cells, *Photometry), Cell constituents, Cytology, Measuring methods.

For abstract, see NSA 30 01, number 02306.

6D. Bionics

N74-21702/7GA PC$4.00/MF$1.45
Techtran Corp., Glen Burnie, Md.
THE MINUTE VOLUME OF THE HEART IN VARIOUS TYPES OF BATH.
C. Kroetz, and R. Wachter. Apr 74, 11p NASA-TT-F-15438
Contract NASW-2485
Tran-Transl. Into English from Klin. Wochschr. (Berlin), V. 12, 1933 p 1517-1520.

Descriptors: *Baths, *Blood circulation, *Heart minute volume, *Human reactions, Carbon dioxide, Cardiovascular system, Heart rate, Salt baths, Stimulation, Water.

For abstract, see STAR 1213

N74-21708/4GA PC$4.00/MF$1.45
Techtran Corp., Glen Burnie, Md.
BIONICS: THEORETICAL AND PRACTICAL PROBLEMS.
U. S. Akhmerov. May 74, 11p NASA-TT-F-15508
Contract NASW-2485
Tran-Transl. Into English from Vestn. Vysshey Shkoly (Ussr), No. 10, Oct. 1973 p 41-45.

Descriptors: *Bionics, *Research facilities, *Research projects, Education, Organizations.

For abstract, see STAR 1213

6E. Clinical Medicine

AD-780 605/2GA Reprint
Naval Hospital Long Beach Calif
RESTORATION OF RESECTED MANDIBLE BY GRAFTING WITH COMBINATION OF MANDIBLE HOMOGRAFT AND AUTOGENOUS ILIAC MARROW, AND POSTOPERATIVE TREATMENT WITH HYPERBARIC OXYGENATION,
Elgene G. Mainous, Phillip S. Boyne, George B. Hart, and Bill C. Terry. 1972, 9p
Availability: Pub. in Oral Surgery, Oral Medicine, Oral Pathology, v35 n1 p13-20 Jan 73.

Descriptors: *Mandible, *Surgical transplantation, Therapy, Regeneration(Physiology), Bones, Bone marrow.
Identifiers: Hyperbaric oxygenation.

Considerable difficulty has been encountered by surgeons in the restoration of the completely resected body of the mandible. Recent experimentation has resulted in the evaluation of a graft technique involving a metallic mesh implant which contains a surface decalcified homogeneous cadaver mandible which has been reduced on the inner surface to accommodate a particulate graft of cancellous bone and marrow taken from the patient's ilium. The details of one such case will be presented. The patient was a 20-year-old woman who had undergone a resection of the mandible. After the surgical procedure she was subjeced to a course of hyperbaric oxygen therapy involving two atmospheres of 100 per cent oxygen 1 hour per day for 30 days. The subjective and objective results of such treatment and the effect on the postoperative course of the osseous regeneration are presented. (Author)

AD-780 668/0GA PC$3.00/MF$1.45
Civil Aeromedical Inst Oklahoma City Okla
EXPERIMENTAL TRAUMA OF OCCIPITAL IMPACTS,
Joseph W. Young, Robert G. Fisher, G. Townley Price, and Richard F. Chandler. Mar 74, 15p FAA-AM-74-4

Descriptors: *Impact shock, Head(Anatomy), Wounds and injuries, Pathology, Physiology, Electroencephalography, Clinical medicine, Experimental data, Baboons, Laboratory animals, Tolerances(Physiology).
Identifiers: *Brain damage.

The paper presents clinical observations, physiological data and pathological findings that have been collected on a series of baboons exposed to controlled occipital impacts under local anesthesia. This acute experimental trauma study was accomplished to establish trauma mechanisms and compare the relative effects of impact with supported heads and heads capable of responding to impact in a controlled horizontal A-P plane. (Modified author abstract)

AD-780 856/1GA PC$5.00/MF$1.45
Army Medical Research Lab Fort Knox Ky
THE TRANSLATION AND REPRODUCTION OF SCIENTIFIC TREATISES IN BLOOD GROUP IMMUNOLOGY 1963-1964,
Second edition,
Frank R. Camp, Jr., Frank R. Ellis, and Nicholas F. Conte. Mar 74, 154p
Library of Congress Catalog Card no. 76-188448.
Selected Contributions to the Literature of Blood Groups and Immunology.

Descriptors: *Immunology, *Blood groups, Translations, Bibliographies, Genetics.
Identifiers: Forensic medicine.

Contents:
- Gammelgaard thesis;
- ABO system--Dunsfore Memorial;
- Secretion of blood group substances and Lewis system;
- M N and P systems;
- Anthropologic and other applications of blood grouping data;
- Landsteiner centennial;
- Grethe Hartmann monograph.

AD-780 946/0GA PC$5.75/MF$1.45
Naval Postgraduate School Monterey Calif
A STUDY OF DISPLAY DEVICES FOR FEEDBACK OF MEANINGFUL INFORMATION TO ELECTRO-ENCEPHALOGRAM SUBJECTS.
Master's thesis,
Edward James Ohlert. Mar 74, 53p

Descriptors: *Display systems, *Electroencephalography, Brain, Nerve cells, Flight, Simulation, Signal processing, Feedback, Theses, Bioengineering.
Identifiers: *Biofeedback.

Types of tasking used in electro-encephalographic research were defined, and methods of displaying information in each tasking situation were considered. A special device for display of ASW phonograms was designed and built. Finally, a vertical display indicator group from an F-111B aircraft was obtained, and a simulated cockpit arrangement was designed incorporating this equipment. The The implementation of this design will provide an advanced format for flight simulation tasking with displays particularly sutied to biofeedback. (Modified author abstract)

AD-780 960/1GA PC$3.00/MF$1.45
Pan American Health Organization Washington D C
INVESTIGATION OF A DENGUE FEVER EPIDEMIC IN COLOMBIA.
Final rept. 1 Jun 72-31 Dec 73,
Abraham Horwitz. 1 May 74, 19p
Grant DADA17-72-G-9363

Descriptors: *Dengue, *Colombia, Epidemiology, South America, Virus diseases, Viruses, Infectious diseases, Disease vectors, Culicidae, Aedes.
Identifiers: Dengue virus, Aedes aegypti.

During 1971-72 an epidemic of dengue fever occurred in Colombia, S. America. The magnitude, geographic extent, and epidemiological progression of the epidemic is described. Over 400,000 persons in a population of 2.1 million were estimated to have suffered dengue during a 12 months period. The virus, recovered from both man and mosquitoes, was identified as dengue serotype 2. The epidemic was clearly related to a re-infestation of the coastal area with A. aegypti mosquitoes. Surveillance for both the disease and the mosquitoe, supported in part by the grant, was used to guide control activities. (Modified author abstract)

AD-780 974/2GA Reprint
California Univ Torrance Dept of Psychiatry
BIOGENIC AMINE METABOLISM AND NEUROENDOCRINE FUNCTION IN AFFECTIVE DISORDERS,
Robert T. Rubin, Paul R. Gouin, and Russell E. Poland. 1971, 7p NMNRU-72-3
Contract N00014-67-A-0385-0016
Proceedings of the World Congress of Psychiatry (5th) Held in Mexico, 25 Nov-4 Dec 71.
Availability: Pub. in Excerpta Medica International Congress Series, n274 pt2 p1036-1039 1971.

Descriptors: *Mental disorders, *Amines, *Endocrine glands, Pituitary hormones, Neurology, Biochemistry, Metabolism, Central nervous system, Neuroses.
Identifiers: Neurotic depression.

Some interrelationships among the metabolism of biogenic amines and neuroendocrine functioning in affective disorders are discussed. There is considerable evidence that there may be abnormalities of biogenic amine metabolism in the clinical syndromes of mania and depression. A number of recent studies also have suggested that there may be altered regulation of the anterior pituitary by the hypothalamus and higher brain centers during the course of affective disorders. The secretion of anterior pituitary hormones is now known to be under the control of hypothalamic releasing and inhibiting factors, which are, in turn, influenced by biogenic amine metabolism in the hypothalamus and other brain areas. It thus is of interest to consider that the changes in both the level of central nervous system activity and the control of anterior pituitary hormone release are related to alterations in biogenic amine metabolism in the central nervous system of humans with affective disorders. Several examples are presented in the paper. (Modified author abstract)

AD-780 975/9GA Reprint
Navy Medical Neuropsychiatric Research Unit San Diego Calif
PSYCHIATRIC DECISIONS: AN ACTUARIAL STUDY,
Darrel Edwards, and Newell H. Berry. 1974, 10p Rept no. NMNRU-73-3
Availability: Pub. in Jnl. of Clinical Psychology, v30 n2 p153-159 Apr 74.

Descriptors: *Psychiatry, Predictions, Rehabilitation, Vocational guidance, Patients, Employment, Adjustment(Psychology), Decision making.

After a psychiatric crisis in an industrial setting, a recommendation for disposition must be made by the psychiatrist to management for the involved employee. The administration then makes a complex decision based on manpower needs an estimate of the probable outcome for the employee in his industrial setting. The psychiatrist may have recommended that the employee be hospitalized, returned to work with a recommendation for continued treatment, recommended for discharge from the company, or any number of intermediate alternatives. The decisions are not only complex because of the professional judgments involved, but also because of the relationship between psychiatry and management. This paper develops a technology which provides a description of the decision process and a method for increased prediction accuracy. (Modified author abstract)

AD-780 983/3GA Reprint
Naval Medical Research Unit No 4 Great Lakes Ill
IMMUNOLOGICAL INVESTIGATIONS OF MENINGOCOCCAL DISEASE. II. SOME CHARACTERISTICS OF GROUP C ANTIGEN OF 'NEISSERIA MENINGITIDIS' IN THE SERA OF PATIENTS WITH FULMINANT MENINGOCOCCEMIA,
Earl A. Edwards. 5 Nov 73, 8p
Revision of report dated 17 Jun 73. See also Part 1, AD-769 365.
Availability: Pub. in The Jnl. of Infectious Diseases, v129 n5 p538-544 May 74.

Descriptors: *Septicemia, *Neisseria meningitidis, *Meningitis, *Antigens, Immunology, Polysaccharides, Physical properties, Bacteria, Bacterial diseases, Infectious diseases.

The prognosis of patients with septicemia due to group C Neisseria meningitidis, who had high levels of soluble meningococcal antigen in their sera, was poor. The polysaccharide nature of this antigen was suggested by its immunologic similarity to group C purified polysaccharide as shown by counterimmunoelectrophoresis and immunodiffusion tests. The antigen eluted from Sephadex G-200 along with IgM and Blue Dextran 2000. Several properties of the antigen suggested an endotoxin component, i.e., pyrogenicity in rabbits, induction of a 'pyrogenic refractory state' to Escherichia coli lipopolysaccharide, and epinephrine-induced dermal necrosis in rabbits. It is postulated that the circulating antigen may represent a bacterial cell-wall complex containing polysaccharide and lipopolysaccharide, and may be responsible for the vascular and coagulation abnormalities so characteristic of fulminant meningococcemia. (Author)

AD-780 996/5GA PC$4.00/MF$1.45
Army Foreign Science and Technology Center Charlottesville Va
BIOPHYSICAL DETERMINATION OF TIME OF DEATH (SOME THEORETICAL AND SOME EXPERIMENTAL BASES) (MATERIALY K OPREDELENIYU DAVNOSTI SMERTI BIOFIZICHESKIMI METODAMI (NEKOTORYE TEORETICHESKIE I EKSPERIMENTALNYE OBOSNOVANIYA)),
Yu. A. Vladimirov, Kh. A. Kebedmagomedova, and Yu. L. Melnikov. 7 Oct 72, 8p Rept no. FSTC-HT-23-2265-72
Trans. of Sudebno-Meditsinskaya Ekspertiza (USSR) n1 p10-14 1971.

Descriptors: *Death, *Phospholipids, *Membranes(Biology), *Biophysics, Cells(Biology), Chemiluminescence, Polarographic analysis, Determination, USSR, Translations.
Identifiers: Forensic medicine.

The first biophysical process that takes place after death is deterioration of phospho-lipid cellular membranes due to lack of oxygen. A polarograph can monitor the process, giving accurate readings from 30 min. to six hrs. after death. Decrease of chemiluminescence can also be measured. (Author)

AD-781 009/6GA Reprint
Navy Medical Neuropsychiatric Research Unit San Diego Calif
FINNISH SUBJECTS' RECENT LIFE CHANGES, MYOCARDIAL INFARCTION, AND ABRUPT CORONARY DEATH,
Richard H. Rahe, Matti Romo, Linda Bennett, and Pentti Siltanen. 24 Sep 73, 11p Rept no. NMNRU-72-40
Revision of report dated 2 Oct 72.
Availability: Pub. in Archives of Internal Medicine, v133 p221-228 Feb 74.

Descriptors: *Stress(Psychology), *Coronary disease, *Cardiovascular diseases, Death, Statistical data, Finland.
Identifiers: *Life changes, *Myocardial infarction.

Recent life changes data were gathered upon 279 survivors of a documented myocardial infarction and upon 226 cases of abrupt coronary death in Helsinki, Finland. In nearly half of the infarction cases, subjects' recent life changes data were also collected through a separate interview of spouses. Spouses provided the life changes data for all coronary death victims. Significant elevations in subjects' life changes magnitude over the six months immediately prior to infarction or death were seen, compared to their life changes data over the same time interval one year earlier, in all but one group of subjects. This recent life changes elevation was particularly apparent for sudden death victims. Women showed similar recent life changes increases as shown for men. Spouses agreed moderately well with survivors of myocardial infarction as to their recent life changes data over the preceding year. (Author)

AD-781 046/8GA Reprint
Naval Medical Research Inst Bethesda Md
XENOGENEIC RENAL PRESERVATION FOR TRANSPLANTATION IN PRIMATES.
Medical research progress rept. no. 1,
Jeffrey L. Benjamin, and Kenneth W. Sell. 3 Oct 73, 12p
Revision of report dated 22 Feb 73.
Availability: Pub. in Transplantation, v17 n2 p164-172 Feb 74.

Descriptors: *Kidneys, *Transplantation, Lymphocytes, Leukocytes, Immunology, Primates, Experimental data, Preservation, Storage, Organs(Anatomy), Viability.
Identifiers: *Tissue preservation, Xenobanking, Graft versus host disease.

Stumptail monkey kidneys were stored for five days in lethally irradiated baboons and returned to allogeneic macaque recipients. On removal from the intermediate host, stored grafts almost uniformly contained a small focus of interstitial lymphocytes. After reimplantation without immunosuppression a marked mononuclear invasion occurred, beginning at 24 hr around glomeruli and arterioles, and gradually progressing to confluence, with destruction of cortical architecture and graft rejection by 9-30 days. Simultaneous rising antibaboon lymphocytotoxic titers peaked at 7-14 days in macaque recipients, and remained elevated until rejection was complete. This was compared to a similar rise in lymphocytotoxic titers in recipients of xenobanked autografts, where, however, a decrease to normal occurred accompanied by a spontaneous reversal of the mononuclear infiltrate. (Author)

AD-781 049/2GA Reprint
Naval Medical Research Inst Bethesda Md
DIFFERENTIAL SUSCEPTIBILITY OF MURINE T AND B LYMPHOCYTES TO FREEZE--THAW AND HYPOTONIC SHOCK.
Medical research progress rept. no. 1,
Douglas M. Strong, Aftab Ahmed, Kenneth W. Sell, and Donald Greiff. 10 Sep 73, 15p
Availability: Pub. in Cryobiology, v2 n2 p127-138 Apr 74.

Descriptors: *Lymphocytes, Cells(Biology), Freezing, Thawing, Damage, Osmotic pressure, Sensitivity, Bone marrow, Thymus, Immunology, Transplantation.

Experiments were carried out to determine if thymic-derived lymphocytes (T-cells) could be differentially damaged by hypotonic and/or freeze-thaw stress. The uptake of 3H-thymidine after stimulation of murine spleen cells with phytohemagglutinin-P (PHA-P) or bacterial endotoxin (LPS) was used as an indicator of recovery. Optimal freezing and thawing techniques showed that 100% of LPS-responsive cells could be recovered, compared to 65% of PHA-responsive cells. These differences could be increased by treatment of spleen cells with 0.17 M NH4Cl prior to freezing and thawing. This represented a recovery of 50% of LPS-responsive cells and less than 10% of PHA-responsive cells. A similar effect could be obtained by treating NH4Cl-treated spleen cells with distilled water prior to culture. It is hypothesized that T-cells are more susceptible to osmotic damage than B-cells due to their differences in membrane characteristics. (Author)

AD-781 050/0GA Reprint
Naval Medical Research Inst Bethesda Md
IMMUNOCHEMICAL NATURE OF SCHISTOSOMAL ANTIGENS IN THE INDUCTION OF DELAYED HYPERSENSITIVITY.
Medical research progress rept. no. 1,
Leo Yuan, and Kenneth W. Sell. 12 Oct 73, 11p
Revision of report dated 14 Aug 73.
Availability: Pub. in Immunochemistry, v2 p235-242 1974.

Descriptors: *Antigens, *Schistosoma mansoni, *Allergic diseases, Hypersensitivity, Immunology, Immunity, Parasites, Guinea pigs, Experimental data.
Identifiers: Skin tests, Immunochemistry.

Carcariae of Schistosoma mansoni were found to contain potent antigens for the production of delayed hypersensitivity in guinea pigs without any detectable circulating antibodies. The delayed sensitivity was first detected five days after sensitization with five micrograms of cercarial antigens in Freund's complete adjuvant by the skin reaction and macrophage migration inhibition test. Transfer of lymphoid cells from highly sensitized donors to normal recipients by subcutaneous injection induced the specific delayed response that began three days after the transfer and remained for a period of one month. The passively transferred immunity in the recipients resembled the typical tuberculin type of delayed hypersensitivity with respect to the skin reactivity, responses of the intraperitoneal exudate cells to antigens, and the characteristic cellular response. (Modified author abstract)

AD-781 063/3GA PC$3.00/MF$1.45
School of Aerospace Medicine Brooks AFB Tex
LITERATURE REVIEW: ADVANCES IN EVALUATING SERUM BILIRUBIN ELEVATIONS.
Aeromedical Review,
Raymond G. Troxier. May 74, 18p Rept nos. SAM-TR-74-10, SAM-Review-3-74

Descriptors: *Bile pigments, Blood serum, Liver diseases, Blood diseases, Diagnosis(Medicine).
Identifiers: *Jaundice, Clinical chemistry, *Laboratory diagnosis.

Unexplained elevations in total serum bilirubin are a common and perplexing problem to physicians who must interpret the clinical laboratory screening results in an apparently healthy population. The patients seen by the USAFSAM Consultation Service have a 3.9% incidence of unexplained elevated total serum bilirubin. In order to select and interpret followup studies, the physician must have a thorough understanding of the pathophysiology of conjugated and unconjugated hyperbilirubinemia. The literature on this subject is reviewed, and appropriate followup studies are recommended. (Author)

CONF-731141-1 PC$4.25/MF$1.45
Tennessee Univ., Knoxville (Usa). Dept. Of Microbiology; Oak Ridge National Lab., Tenn. (Usa).
PROPOSED MECHANISMS BY WHICH AUTOCHTHONOUS NEOPLASMS ESCAPE IMMUNE REJECTION.
J. H. Jr. Coggin, K. R. Ambrose, P. J. Dierlam, and N. G. Anderson. 1973, 42p

Descriptors: (*Neoplasms, *Immune reactions), Animal cells, Biochemical reaction kinetics, Hamsters.

For abstract, see NSA 30 01, number 02293.

COO-3424-1 PC$4.75/MF$1.45
Peter Bent Brigham Hospital, Boston, Mass. (Usa).
PROGRAM FOR THE STUDY OF TRANSPLANTATION OF TISSUES AND ORGANS AND RELATED TOPICS IN SURGICAL RESEARCH. FINAL TECHNICAL REPORT, JANUARY 1, 1973.
F. D. Moore. 1 Jan 74, 34p
Contract AT(11-1)-3424

Descriptors: (*Surgery, *Research programs), (*Transplants, Research programs), (*Immunosuppression, *Whole-body irradiation), Biological shock, Body, Burns, Cardiovascular diseases, Endocrine glands, Hemorrhage, Injuries, Isotope dilution, Lungs, Measuring methods, Metabolism, Nutrition.

For abstract, see NSA 30 01, number 00727.

JPRS-62041 PC$3.00/MF$1.45
Joint Publications Research Service, Arlington, Va.
MEDICAL AND GEORGAPHIC ASPECTS OF LONG-TERM ECONOMIC DEVELOPMENT OF THE ANGAR-YENISEY REGION,
B. B. Prokhorov. 21 May 74, 19p
Trans. of Akademiya Nauk SSSR. Sibirskoe Otdelenie. Izvestiya, n11 p44-55 1973.

Descriptors: *Clinical medicine, *USSR, Evaluation, Economics, Geography, Translations.

In recent years the need for medical and geographical evaluation of new territories opened for settlement has become obvious in the studies conducted by geographic economists. Experience in the settling of the northern rayons of Siberia and the Far East has shown that neglect of medical and geographical research led to, along with other causes, great economic losses due to high turnover of the labor force, increased morbidity of the population, and great expenses involved in improving the territory because of poor choice in selecting sections for a build up. In view of this, studies were commended on the medical and geographical aspects of rayons selected for commercial development at the Institute of Siberian and Far Eastern Geography of the Siberian Branch of the USSR Academy of Sciences.

N74-21711/8GA PC$4.00/MF$1.45
Kanner (Leo) Associates, Redwood City, Calif.
COMPUTER DIAGNOSIS.
L. Kruglov. Apr 74, 8p NASA-TT-F-15529
Contract NASW-2481
Tran-Transl. Into English from Selskaya Zhizn Newspaper (Ussr), 3 Nov. 1973 4 p.

Descriptors: *Clinical medicine, *Computers, *Heart diseases, *Signs and symptoms, Bioinstrumentation, Peritoneum, Rheumatic diseases.

For abstract, see STAR 1213

N74-22585/5GA PC$11.00/MF$1.45
George Washington Univ., Washington, D.C. Technology Applications Group.
NASA TECHNOLOGY UTILIZATION APPLICATIONS.
Final Report, Sep. 1972 - Aug. 1973.
Nov 73, 160p NASA-CR-138178
Contract NASW-2444

Descriptors: *Aerospace medicine, *Technology transfer, *Technology utilization, Bioengineering, Human factors engineering, Information dissemination, Medical science.

For abstract, see STAR 1213

ORO-4257-2 PC$4.00/MF$1.45
North Carolina Univ., Chapel Hill (Usa). School of Medicine.
CHEST FLUOROSCOPY AND NEOPLASIA IN TUBERCULOSIS PATIENTS: A RETROSPECTIVE SURVEY.
1974, 17p

Descriptors: (*Chest, *Fluoroscopy), Economics, Man, Neoplasms, Tuberculosis, X radiation.

For abstract, see NSA 30 01, number 02302.

PAT-APPL-180 900 PC$4.00/MF$1.45
Department of Health, Education, and Welfare, Bethesda, Md. Patent Branch.
TREATMENT OF SICKLE CELL ANEMIA.
Patent Application,
Anthony Cerami, and James M. Manning. 15 Sep 71, 20p DHEW-PH(G)-194-71
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Patent applications, *Sickle cell anemia, *Cyanates, Therapy.
Identifiers: *Potassium cyanate.

The patent application relates to the discovery that cyanate, such as a 0.01-1.0M potassium cyanate solution, is useful to prevent the sickling of the red blood cells of sickle cell anemia patients. It has also been discovered that red blood cells when taken from sickle cell anemia patients and treated in vitro with a cyanate, such as a sodium cyanate solution, evidence an increased survival or prolonged life when returned to the patient.

PB-232 757/5GA PC$4.75/MF$1.45
Nathan (Robert R.), Associates, Inc., Washington, D.C.
ASSESSMENT AND EVALUATION OF THE IMPACT OF ARCHETYPAL NATIONAL HEALTH INSURANCE PLANS ON U.S. HEALTH MANPOWER REQUIREMENTS,
Lien-fu Huang, and Elwood W. Shomo. Feb 74, 136p*
Contract PHS-72-4404
Report on DMI Technology Development.

Descriptors: *Health insurance, Models, Evaluation, Manpower, Medical services, Medical personnel, Utilization, Demand(Economics), Tables(Data).

Various hypothetical national health insurance plans are expected to effect the demand for health care and the future requirements for health manpower. To assess these effects, the insurance coverage status under private and public health insurance plans was determined; also determined were the estimations of the percentage of the population covered by third parties, the actual average coinsurance rate and the price elasticity for each care category. 1969 baseline data was used for health care utilization rates; and for health manpower distribution by care category estimates, and its projections based on population; population projections were for 1980, 1985 and 1990. Demand models for the target years were formulated using the coinsurance rate as the insurance variable and price elasticity as the basic parameter, and from these, health manpower requirements were calculated. The results show that health manpower requirements vary according to reimbursement features, real price elasticity, and the form of the model according to reimbursement features, real price elasticity, and the form of the model projected.

PB-232 766/6GA PC$3.00/MF$1.45
La Rabida-Univ. of Chicago Inst., Ill.
IMMUNIZATION OF HUMANS WITH GROUP A. STREPTOCOCCAL M PROTEIN.
Progress rept. 1 Jun 73-31 May 74,
Eugene N. Fox. 20 Feb 74, 16p IDB-VDP-02-088
Contract N01-AI-32519
See also PB-218 986.

Descriptors: *Vaccines, *Streptococcus, *Immunology, Bacterial diseases, Tables(Data), Experimental data, Injections(Medicine), Nose, Spraying, Children, Adults, Dosage, Immunity, Evaluation, Serology, Respiratory diseases, Proteins, Antigens, Antibodies.

The report summarizes the following studies: Intranasal immunization of children, effect of trivalent booster dose; Intranasal immunization and challenge; Type 12 immunization and challenge, preliminary results.

PB-232 778/1GA PC$3.25/MF$1.45
Roosevelt Hospital, New York.
LONGITUDINAL EVALUATION OF VACCINES IN CONTROL OF RUBELLA.
Annual contract progress rept. 1 Jan-31 Dec 73,
S. Krugman, and Louis Cooper. 1973, 36p* IDB-VDP-01-070
Contract NO1-AI-9-2222
See also PB-205 736.

Descriptors: *Vaccines, *Rubella, *Viral diseases, Viruses, Immunity, Immunology, Antibodies, Evaluation, Humans.
Identifiers: *German measles.

Longitudinal studies of HI antibody persistence after rubella, rubella vaccination and congenital rubella among persons living in the community and in an institution which has been 'free from detectable rubella' since 1964 have revealed no change in the pattern. The rate of decline of HI titers following rubella or rubella vaccination is greater among the institutionalized population. In congenital rubella, decline is similar in both populations. The presence of rubella specific IgM HI antibody was correlated with young age, virus shedding and elevated levels of total IgM in a group of 143 children studied during the first two yrs. of life. Ongoing comprehensive rubella antibody screening and vaccination programs have continued. The susceptibility rate for this young adult population is approximately 12%, with the exception of those groups which are predominately Puerto Rican, where susceptibility exceeds 20%.

PB-232 779/9GA PC$3.75/MF$1.45
Baylor Coll. of Medicine, Houston, Tex.
EVALUATION OF EXPERIMENTAL RESPIRATORY VIRUS PROPYLACTIC AND THERAPEUTIC AGENTS IN NORMAL VOLUNTEERS.
Annual rept. 1 Aug 72-1 Sep 73,
Robert B. Couch. 31 Oct 73, 61p IDB-VDP-11-068

Contract NO1-AI-32506
See also PB-213 518.

Descriptors: *Influenza virus, *Adenoviruses, *Vaccines, *Respiratory diseases, Mycoplasma, Viruses, Immunity, Immunology, Serology, Epidemiology, Evaluation, Antibodies, Humans.
Identifiers: *Mycoplasma pneumoniae.

The progress report covers a thirteen-month period and includes virological, immunological, clinical, and epidemiological data developed from study of 450 volunteers. These individuals participated in vaccine studies and in investigations involving experimental or natural challenge with live agents. Other studies included a reevaluation of primary and heterologous antibody responses to influenza viruses in man. Also, a status report on the development of methods for assessing cellular immunity is included. Standard virological and serological procedures were used in the reported studies and are not described. Information in the report is presented according to the agent studied and includes results obtained in studies with Mycoplasma pneumoniae, influenza virus, and adenovirus.

PB-232 799/7GA PC$3.00/MF$1.45
Tulane Univ., Covington, La. Delta Regional Primate Research Center.
STUDY OF HEPATITIS B IN CHIMPANZEES.
Annual rept. 21 Dec 72-3 Dec 73,
William P. Allen, Robert H. Wolf, and Hans F. Smetana. 20 Dec 73, 12p IDB-VDP-12-074
Contract NO1-AI-1-2197

Descriptors: *Hepatitis, Viral diseases, Hepatitis viruses, Chimpanzees, Experimental data, Laboratory animals, Histology, Pathology, Hematology, Blood chemical analysis.

Clinical, laboratory and histopathologic studies of experimental viral hepatitis were started on five chimpanzees on June 1, 1972, with pre-experimental observations lasting until March 26, 1973, at which date four chimpanzees were inoculated with infectious materials of viral hepatitis. During this pre-experimental period clinical observations were made on the five animals and a number of laboratory tests were performed with determinations of the number of erythrocytes, differential leukocytes, values of hemoglobin, hematocrit and total serum bilirubin as well as serum enzymes - SGOT, SGPT, ICD and LDH; in addition needle biopsies of the liver were executed at regular intervals for histopathologic studies of the liver. During this period of observation one chimpanzee died of an intercurrent disease and this animal was replaced. The remaining four chimpanzees were observed and followed clinically for over eight months post-infection.

PB-232 825/0GA PC$3.25/MF$1.45
Children's Hospital, Buffalo, N.Y. Div. of Virology.
HEPATITIS STUDY CENTER, WEST SENECA STATE SCHOOL, PHASE-I: EPIDEMIOLOGY OF TYPE B HEPATITIS.
Annual rept. 1 Jul 73-1 Mar 74,
P. L. Ogra, B. L. Kaul, and V. Likihite. 4 Mar 74, 32p IDB-VDP-03-094
Contract N01-AI-3-2522

Descriptors: *Hepatitis, Serology, Viral diseases, Epidemiology, Antigens, Antibodies, Hepatitis viruses, Populations, New York.

A center for the study of epidemiology of hepatitis infection in institutionalized population was established at West Seneca State School, West Seneca, New York. Initial screening for hepatitis B antigen (HBsAg) and antibody to HBsAg (anti-HBs) in approximately 1,000 residents and staff members of the school tested approximately 10% of the residents were found to be positive for HBsAg and 44% were found to be positive for anti-HBs. The prevalence rate of anti-HBs in school staff was 24% and no staff member was found to be positive for HBsAg. These observations suggest a high prevalence of prior exposure to HBsAg in this population. However, it should be pointed out that a significant proportion of the population (48%) of residents and (74%) of staff have no serologic evidence of infection as demonstrated by the absence of HBsAg and anti-HBs activity in the serum. The acquisition of HB infection appeared to be related to a number of factors, in particular to the duration of residence at the institute.

PB-232 852-T/GA PC$4.00/MF$1.45
National Institutes of Health, Bethesda, Md. Translation Unit.
RESULTS OF TREATMENT IN PATIENTS WITH TROPOBLASTIC DISEASE (BASED ON MATERIALS OF THE N. N. PETROV INSTITUTE OF ONCOLOGY OF THE USSR MINISTRY OF PUBLIC HEALTH),
I. D. Nechaeva, and A. V. Semenovskii. Jun 74, 9p NIH-74-429C
Trans. of Voprosy Onkologii (USSR) v20 n1 p44-49 1974.

Descriptors: *Pregnancy complications, *Neoplasms, *Antineoplastic agents, Malignant neoplasms, Cells(Biology), Surgery, Chorioepithelioma, Choriocarcinoma, Patients, USSR, Translations, Therapy.

The immediate results of treatment of trophoblastic tumor patients were that of the 43 patients with various types of vesicular mole all were discharged in satisfactory condition with no symptoms of the disease. Of the 42 patients with chorionepithelioma of the uterus all were discharged in satisfactory conditions, but four patients subsequently died, three of the basic disease and one of cardiac insufficiency. Of 60 patients with chorionepithelioma of the uterus with metastases, seven died in the hospital and 53 were discharged with no symptoms of the disease. Another 17 persons of this group died of the basic disease at varying periods afterward. The five-year survival rate of patients with trophoblastic tumors are: Vesicular mole (100%); chorionepithelioma with metastases (47.9%); chorinepithelioma without metastases (92.2%).

PB-232 853-T/GA PC$4.25/MF$1.45
National Institutes of Health, Bethesda, Md. Translation Unit.
PROBLEM AND SUBJECT PLAN FOR RHEUMATOLOGY--1973,
A. I. Nesterov, V. A. Nasonova, and A. Yu. Bolotina. Jun 74, 24p NIH-74-338C
Trans. of Voprosy Revnatizma (USSR) n3 p77-86 1973.

Descriptors: *Arthritis, *USSR, Rheumatoid arthritis, Musculoskeletal disorders, Research management, Translations.

The report presents plans for a research program for 1973 regarding rheumatic diseases. The development of the program will involve the participation of 95 medical and scientific institutes and their various clinical departments; the greatest number of programs being planned for the Institute of Rheumatism of the USSR Academy of Medical Sciences, the Institute of Experimental and Clinical Medicine of the Ministry of Health of the Lithuanian SSR, and the Volgograd, Riga, Crimean, and Samarkand Medical Institutes.

PB-232 855-T/GA PC$4.00/MF$1.45
National Institutes of Health, Bethesda, Md. Translation Unit.
PREOPERATIVE CHEMOTHERAPY IN PATIENTS WITH MALIGNANT OVARIAN TUMORS,
A. K. Pankov, G. A. Nerodo, E. G. Ilinskaya, and R. I. Shtirmer. 7 Jun 74, 8p NIH-74-457
Trans. of Voprosy Onkologii (USSR) v19 n2 p20-23 1973.

Descriptors: *Ovarian neoplasms, *Antineoplastic agents, Surgery, Mortality, Patients, Drug therapy, USSR, Translations.
Identifiers: Thio-TEPA.

Preoperative drug therapy has allowed for a 75% increase in surgical treatment of patients with malignant ovarian tumors. It was found that the survival rates for patients who were administered preoperative drug therapy was considerably higher than those whose treatment began with surgical intervention. The three year survival rate was 37.5% in patients with preoperative drug therapy and 8.7% in patients without preoperative drug therapy.

PB-232 886/2GA PC$4.75/MF$1.45
West Virginia Div. of Vocational Rehabilitation, Charleston.
A PROJECT FOR THE EXPANSION OF VOCATIONAL REHABILITATION SERVICES IN RURAL HOSPITALS IN COOPERATION WITH THE WELFARE MEDICAL ASSISTANCE PROGRAM.
Final rept. 24 Jun 68-23 Jun 71,
William R. Phelps. 23 Jun 74, 35p
Grant SRS-25-65220

Descriptors: *Medical services, Hospitals, Patients, West Virginia, Tables(Data), Rural areas.
Identifiers: Medicare, Medicaid, *Vocational rehabilitation, Welfare assistance.

The three-year expansion project was carried out at the Lewisburg District Office of the W. Va. Division of Vocational Rehabilitation. It was concerned with the problems--the delivery of vocational rehabilitation services, to patients in rural communtiy hospitals and the utilization of the Welfare Title XIX Program, Serving Vocational Rehabilitation Clients. A vocational rehabilitation counselor working out of the Lewisburg District Office devoted full time to serving two hospitals--the Greenbrier Valley Hospital in Greenbrier County; and Sacred Heart Hospital in nearby Nicholas County. The project received 270 new referrals from the two hospitals, provided VR services to 217 clients and rehabilitated 109 clients into gainful occupations.

PB-232 918/3GA PC$3.00/MF$1.45
California Univ., San Francisco. School of Medicine.
IMMUNIZATION OF INFANTS AND CHILDREN WITH PNEUMOCOCCAL POLYSACCHARIDE OCTAVALENT VACCINE AND QUANTITATION OF ANTIBODY RESPONSE.
Annual rept. Apr-Dec 73,
Arthur J. Ammann. Jan 74, 11p IDB-ASP-01-042
Contract NO1-AI-22500

Descriptors: *Vaccines, *Diplococcus, *Polysaccharides, Dosage, Immunity, Immunology, Antibodies, Bacteria, Bacterial diseases, Responses, Infants, Children.

Data has been compiled which indicates that the pneumococcal polysaccharide (PPS) vaccines are as effective in producing a significant antibody titer increase as is individual monovalent vaccine. The doses required for an appropriate antibody response are 25 to 50 ucgm. No increase in local or systemic reactivity was observed in individuals immunized with polyvalent vaccine. The octavalent vaccine as used in this study appears to be both safe and immunogenic. The long term duration of response has not yeat been determined. Preliminary data indicates that greater than 50% of infants less than six months of age fail to respond with a significant antibody titer increase to immunization with single 25 uggm doses of PPS octavalent vaccine. Studies using 50 ucgm and booster doses are being initiated.

PB-233 041/3GA PC$5.50/MF$1.45
Wayne State Univ., Detroit, Mich. Dept. of Neurosurgery.

BREAKING STRENGTH OF THE HUMAN SKULL VS IMPACT SURFACE CURVATURE.
Final rept. 20 Dec 71-31 Mar 73,
R. Voigt, and L. Murray Thomas. Nov 73, 189p
DOT-HS-801 002
Contract DOT-HS-146-2-230
See also PB-204 239.

Descriptors: *Skull, *Fracture strength, *Impact strength, Head(Anatomy), Injuries, Acceleration tolerance, Breaking load, Motor vehicle accidents, Anatomy, Anthropometry, Tables(Data), Computer programs.

An investigation has been conducted into the effects of surface shape, hardness and impact location on the heads of human cadavers. This is the second year of a study involving eighty cadavers and most of the important results and conclusions are listed and discussed in this report. Impact surfaces included flat rigid and resilient, rigid cylindrical 1/8 in. radius up to 1 in. radius, resilient cylindrical 1 in. radius and rigid hemispherical shapes ranging from 3 in. to 8 in. radius. Impact locations include front, side and rear. The various impact conditions are related to type of skull fracture produced and several head injury parameters such as, velocity, peak force, acceleration, contact pressure and magnitude, and head injury criterion (HIC).

PB-233 234/4GA PC$3.00/MF$1.45
Carnegie-Mellon Univ., Pittsburgh, Pa.
HOSPITAL COST AND PRODUCTION FUNCTIONS.
Final rept. 1 Feb 68-31 Jan 71,
Judith R. Lave, and Lester B. Lave. May 74, 11p
BHSR-74-46
Grant PHS-00069

Descriptors: *Hospitalizing, *Medical services, Patients, Costs, Economic analysis, Quality assurance, Pennsylvania.
Identifiers: *Medical economics, Health Services research and development.

The effect of case-mix, size, and utilization rates on hospital cost per case and patient day was examined. Data for hospitals in Western Pennsylvania were used. The end product of this grant was a series of highly regarded articles in the economic journals which focused on the factors which affect hospital costs.

PB-233 632/9GA PC$4.00/MF$1.45
Health Resources Administration, Rockville, Md. Div. of Facilities Utilization.
PROCEEDINGS: WORKSHOP ON PATIENT EDUCATION PROGRAMING HELD AT MARRIOTTSVILLE, MD. SPIRITUAL CENTER, ON APRIL 30-MAY 3 1973.
1973, 92p DHEW/HRA-74-4002

Descriptors: *Meetings, *Patients, *Education, Hospitals, Health, Medical services, Projects, Planning, Cost effectiveness, Maryland.
Identifiers: Hill-Burton projects, *Medical education.

The workshop was held for the purpose of providing guidelines and assistance for developing and refining specific patient education plans in a variety of health settings in Maryland. Educational plans developed by 23 multidisciplinary teams for their selected target populations are included along with addresses and panel discussions presented during plenary sessions. The report presents the philosophy, problems, and program activities that persons involved need to know about this educational right of patients and their families.

6F. Environmental Biology

AAEC/E-303 PC$4.00/MF$1.45
Australian Atomic Energy Commission Research Establishment, Lucas Heights.
USE OF A RADIOACTIVE TRACER TO STUDY THE NESTING SYSTEM OF MASTOTERMES DARWINIENSIS FROGGAT.
W. T. Spragg, and R. E. Fox. Jan 74, 10p

Descriptors: (*Insects, Pest control), (*Tracer techniques, *Scandium 46), (*Pest control, Tracer techniques), Biological half-life, Counting rates, Excretion, Gamma radiation, Gold compounds, Ingestion, Radiation doses, Radiocolloids, Scandium oxides, Translocation.

For abstract, see NSA 30 01, number 00726.

AD-780 979/1GA Reprint
Naval Medical Field Research Lab Camp Lejeune N C
USE OF FUMIGANTS FOR CONTROL OF BODY LICE.
Medical research progress rept. no. 6,
Roger H. Grothaus, and M. M. Cole. 1973, 7p
Reprinted as Naval Medical Field Research Lab. Volume 24, Number 9, June 1974.
Availability: Pub. in The Control of Lice and Louse-Borne Diseases, Pan American Health Organization Scientific Publication n263 p192-195 1973.

Descriptors: *Lice, *Pest control, *Disinfection, Disease vectors, Infectious diseases, Medical research, Insects.
Identifiers: *Fumigation.

A growing problem with respect to insecticide resistance in human body lice has caused a renewed interest in alternative methods of control. The status of both old and new fumigants have been reviewed to ascertain if they might prove valuable in controlling resistant lice populations. Unfortunately, no fumigant has been found that will provide good control in all environmental situations. The fumigants are particularly ineffective where non-infected individuals must return to unhygienic environments. The fumigants which may have potential include: hydrogen cyanide, methyl bromide, ethyl formate, aluminum-phosphide, and dichlorvos. Hydrogen cyanide, ethyl bromide and aluminum phosphide can be used for chamber fumigation with certain restrictions, while ethyl formate and dichlorvos have potential in individual clothing treatments. It is possible that by using combined fumigation techniques, control can be achieved in most environmental situations. It appears that fumigation is still not the most practical method of controlling widespread infestations and louse-borne disease epidemics. (Author)

AD-780 980/9GA Reprint
Naval Medical Field Research Lab Camp Lejeune N C
SOME CANDIDATE LOUSE POWDERS.
Medical research progress rept. no. 7,
M. M. Cole, P. H. Clark, and Roger H. Grothaus. 1973, 5p
Reprinted as Naval Medical Field Research Lab. Volume 24, Number 10, June 1974.
Availability: Pub. in The Control of Lice and Louse-Borne Diseases, Pan American Health Organization Scientific Pub. n263 p179-180 1973.

Descriptors: *Lice, *Pest control, *Disinfection, *Carbamates, Organic sulfur compounds, Powders, Infectious diseases.
Identifiers: Evaluation, Abate, Carbaryl, *Phosphorothioates.

During the past several years, several new candidate louse powders have been developed through a cooperative program between the U. S. Department of Agriculture and the Department of Defense. These compounds include Abate, Cidial, Mobam, Carbaryl and GS-12968. The paper reports the advantages, disadvantages, availability, and current stage of development of each chemical in order of preference. (Author)

AD-780 981/7GA Reprint
Naval Medical Field Research Lab Camp Lejeune N C
SCREENING AND TESTING TECHNIQUES FOR NEW LOUSE POWDERS.
Medical research progress rept. no. 8,
Roger H. Grothaus, and M. M. Cole. 1973, 6p
Reprinted as Naval Medical Field Research Lab. Volume 24, Number 11, June 1974.
Availability: Pub. in The Control of Lice and Louse-Borne Diseases, Pan American Health Organization Scientific Pub. n263 p141-143 1973.

Descriptors: *Lice, *Pest control, *Disinfection, Insecticides, Pesticides, Powders, Infectious diseases, Entomology.
Identifiers: Pediculus humanus, Pediculidae.

A joint Department of Defense and U.S. Department of Agriculture (USDA) program has been established to develop new louse powders. This program became active because of the DDT resistant lice encountered in Korea. The major portion of the program consists of a complete screening and testing project which includes five steps. The initial entomological screening of new compounds is accomplished at the Insects Affecting Man and Animals Research Laboratory, Entomology Research Division, Agricultural Research Service, USDA. Compounds that show promise are forwarded to the Toxicology Division, U.S. Army Environmental Hygiene Agency (AEHA). Chemicals cleared for human exposure by the AEHA are tested on United States Marine Corps volunteers at the Naval Medical Field Research Laboratory. Candidate compounds surviving these simulated field tests are taken to Korea for large-scale tests on humans infested with natural lice populations. Powders selected for final testing are chosen on the basis of effectiveness against lice, safety of the compound with respect to humans, odor acceptability, cost, probable availability, and staining properties. This paper describes the detailed laboratory procedures utilized in each of the five test steps. (Author)

N74-22032/8GA PC$5.00/MF$1.45
Kansas Univ. Center for Research, Inc., Lawrence. Technology Applications Lab.
THE USE OF HIGH ALTITUDE AERIAL PHOTOGRAPHY TO INVENTORY WILDLIFE HABITAT IN KANSAS: AN INITIAL EVALUATION.
J. W. Merchant, and B. H. Waddell. Mar 74, 36p
TR-2230-14-1
Contract NGL-17-004-024
Misc-Original Contains Color Illustrations.

Descriptors: *Aerial photography, *Infrared photography, *Remote sensors, *Resources management, Color photography, Data acquisition, Data processing, Mapping, Wildlife.

For abstract, see STAR 1213

PATENT-3 463 122 Not available NTIS
Department of Agriculture, Washington, D.C.
PROCESS FOR DELAYED PRODUCTION OF JAPANESE BEETLE LARVAE.
Patent,
Grant St. Julian. Filed 25 Sep 67, patented 26 Aug 69, 2p PAT-APPL-670 376,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Insect control, *Larvae, *Storage, *Patents, Beetles, Viability, Bacteria, Spores, Sodium chloride.
Identifiers: PAT-CL-119-6, Biological insect control, Popillia japonica, Japanese beetles, Bacillus popilliae.

The invention relates to the storage of fertile Japanese beetle eggs for as long as three weeks to provide an out-of-season supply of newly hatched larvae. The freshly collected eggs are stored at 3-5C. in 0.85% NaCl solution for the desired period,

then incubated at ca 26C. to induce the hatching of the surviving viable eggs. Many thousands of Japanese beetle larvae are used annually at this and other laboratories in research towards the in vitro production of Bacillus popilliae spores for use as a biological insecticide.

PB-232 765/8GA PC$3.25/MF$1.45
National Environmental Research Center, Cincinnati, Ohio. Methods Development and Quality Assurance Research Lab.
LITERATURE SURVEY OF INSTRUMENTAL MEASUREMENTS OF BIOCHEMICAL OXYGEN DEMAND FOR CONTROL APPLICATION 1960-1973.
Environmental monitoring series,
Robert J. O'Herron. Feb 74, 33p* EPA-670/4-74-001

Descriptors: *Biochemical oxygen demand, *Sewage treatment, *Measuring instruments, *Water analysis, Oxygen demand, Measuring instruments, Reviews, Process control, Organic compounds, Waste water.
Identifiers: Chemical oxygen demand, Secondary sewage treatment, Respirometers.

The report attempts to determine the 'state of the art' of instrumental biochemical oxygen demand (BOD) methods through a survey of related literature that included material published between 1960 and 1973. Although the present 'state of the art' does not permit instrumental measurement of BOD for process control, an alternative solution is suggested for secondary treatment plants. Differential measurements (Delta TOC, Delta TOD, or Delta COD) of the secondary effluent and the processed sample produces a good estimate of the ultimate BOD. Successful efforts in this research would produce greater operating efficiency and reduction in pollution discharge to receiving streams by the waste treatment plants. (Modified author abstract)

PB-232 836/7GA PC$18.50/MF$1.45
Virginia Polytechnic Inst. and State Univ., Blacksburg.
THE RECOVERY OF STREAM MACROBENTHIC COMMUNITIES FROM THE EFFECTS OF ACID MINE DRAINAGE.
Doctoral thesis,
Edwin Eugene Herricks. Jun 73, 307p W74-08701, OWRR-B-034-VA(4)

Descriptors: *Mine waters, *Benthos, *Aquatic biology, Water pollution, Water quality, Neutralization, Pennsylvania, Theses, Ecology, Limnology, Models, Stress(Physiology), Recovery.
Identifiers: *Mine acid drainage, *Water pollution effects(Animals), *Water pollution effects(Plants).

The effects of short term low pH and long term acid mine drainage (AMD) stress were studied in relation to recovery and restoration of aquatic macrobenthic communities. Experimental acid additions were made to a healthy productive stream. Recovery was related to downstream drift of recolonizing organisms. A second study was made to observe drift born recolonizing organisms. Baetis sp. dominated drift collections and was most abundant in bottom fauna collections indicating a relationship between drift and section recovery. A two-year study was made on Indian Creek, Fayette Co., Pa. which received a major and several minor AMD discharges. Recovery was shown by density and diversity values similar to upstream reference stations. The addition of unpolluted tributary waters provided suitable habitat for recolonizing organisms and recovery occurred within 10 miles of the initial AMD discharges. Hydrologic and water quality models were also applied and developed. Estimated periods of high stream discharge correlated well with periods of high stream density and diversity in stream biota.

PB-232 949/8GA PC$4.75/MF$1.45
Maryland Univ., Solomons. Natural Resources Inst.
THE ROLE OF ORGANIC DEBRIS AND ASSOCIATED MICRO-ORGANISMS IN PELAGIC ESTUARINE FOOD CHAINS.
Completion rept. Jul 72-Sep 73,
Donald R. Heinle, David A. Flemer, Joseph F. Ustach, Richard A. Murtagh, and Roger P. Harris. 1973, 130p NRI-Ref-74-29, TR-22 W74-08837, OWRR-B-016-MD(1)
Contract DI-14-31-0001-3893
See also report dated Oct 72, PB-223 016.

Descriptors: *Detritus, *Swamps, *Food chains, Estuaries, Patuxent River, Maryland, Microorganisms, Primary biological productivity, Decomposition, Crustacea.
Identifiers: Eurytemora affinis, Copepoda, Scottlana canadensis, *Eutrophication.

Production on marshes adjacent to the upper Patuxent estuary was 1,000 to 1,500 grams dry weight per square meters per year. Approximately 6 to 9 percent of the annual production was exported to the estuary as particulate carbon. Production was comparable to other marsh systems but export (as percentage of production) was less, probably due to poor tidal exchange. In spite of the relatively low percentage of their fixed carbon contributed to the estuary, the marshes provide about one-third of the total carbon budget in the upper Patuxent. A large portion of the marsh carbon enters the estuarine system in early spring when levels of algal primary production are low. Substantial production of the calanoid copepod, Eurytemora affinis occurs with detrital carbon as the apparent food base. Feeding experiments indicate that E. affinis can reproduce when fed a diet of detritus enriched with bacteria and protozoa, or when fed only protozoa. Diets of detritus and micro-organisms alone were seldom equal to algal controls.

PB-232 990/2GA PC-GPO/MF$1.45-NTIS
Idaho Univ., Moscow. Coll. of Forestry, Wildlife, and Range Sciences.
POLLUTION EFFECTS ON ADULT STEELHEAD MIGRATION IN THE SNAKE RIVER.
Ecological research series,
C. Michael Falter, and Rudy R. Ringe. Feb 74, 111p W74-08833, EPA-660/3-73-017
Paper copy available from GPO $1.50 as stock no. EP1.23:660/3-73-017.

Descriptors: *Fishes, *Indicator species, *Snake River, *Trout, Water quality, Toxicity, Animal behavior, Ecology, Limnology, Temperature, Effluents, Water polution, Industrial wastes, Rivers, Animal migrations, Marking, Ultrasonic frequencies, Idaho, Washington(State), Clearwater River.
Identifiers: *Water pollution effects(Animals), Salmo gairdneri.

A three-year field study was conducted in 1969-1971 to assess the relationship of Kraft mill effluent and pre-impoundment water quality to adult steelhead trout (Salmo gairdneri Richardson) behavior in the Snake River, Idaho-Washington. Steelhead were tagged with ultrasonic tags and followed through a 25 km section of the proposed Lower Granite Reservoir. Limnological parameters and compared with fish behavior. No significant correlation could be made between any chemical water quality parameter and steelhead behavior. However, as temperature dropped below 15C fish movement slowed, fish generally stopped moving at night, and resting periods increased in length and number. Steelhead showed a preference to move in water with off-bottom current velocities of 0.2 to 0.5 m/sec and showed a definite pattern of crossover and resting points.

PB-232 998/5GA PC$3.00/MF$1.45
Mackay School of Mines, Reno, Nev.
A STUDY OF THE EUTROPHICATION OF THE SURFACE WATERS OF PYRAMID LAKE.
Completion rept.,
James L. Hendrix, and Marcel F. Deguire. Nov 73, 20p W74-08938, OWRR-A-047-NEV(1)
Contract DI-14-31-0001-3828

Descriptors: *Cyanophyta, *Pyramid Lake, Limnology, Nevada, Algae, Brackish water, pH, Temperature, Inorganic phosphates, Cultures(Biology), Luminous intensity, Growth, Surface waters, Ecology.
Identifiers: *Eutrophication, Nodularia spumigena, *Algal blooms, Anabaena, Water pollution effects(Plants).

The capacity of the Pyramid Lake, Nevada, environment to grow algae was studied. Pyramid Lake is a brackish terminal lake located in the Intermontane region. To understand the uniqueness of the lake's environment, both field and laboratory investigations were necessary. From field studies, the water quality, the pH of the lake, and the temperatures of the lake were obtained during the algal bloom in the summers of 1972 and 1973. By using phosphate concentration as the criteria, the lake could be classified as eutrophic. The main contributor to the bloom was the blue-green algae, Nodularia spumigena. Nodularia spumigena was isolated and cultured in the laboratory. Using the purified stock as inoculant, work using chemostats was conducted. In the fermentors, it has been determined that N. spumigena is sensitive to the light intensity. Light intensities of 100 foot candles for twelve hours per day cause the cell to bleach and then die.

PB-233 070/2GA PC$8.25/MF$1.45
Environmental Protection Agency, Athens, Ga. Surveillance and Analysis Div.
ECOSYSTEMS ANALYSIS OF THE BIG CYPRESS SWAMP AND ESTUARIES.
Final rept.,
M. R. Carter, L. A. Burns, T. R. Cavinder, K. R. Dugger, and P. L. Fore. Jun 73, 379p* DI-SFEP-74-51 EPA-904/9-74-002

Descriptors: *Big Cypress Swamp, Ecology, Geomorphology, Swamps, Estuaries, Primary biological productivity, Florida, Drainage, Climatology, Recommendations, Hydrology, Sediment transport, Detritus, Fisheries, Aquatic biology, Water chemistry.
Identifiers: *Ecosystems, *Wetlands.

The U.S. Environmental Protection Agency (EPA) conducted a two year study to obtain necessary biological and hydrological information for objective planning of wise use of south Florida's land, water, wildlife and fisheries resources. Field investigations during 1971-1972 intensively examined the details of biotic community interactions with hydrologic conditions of disturbed and relatively unaffected regions of the Big Cypress Swamp and contiguous tidal wetlands and estuaries. Process studies and experimental manipulation models were formulated for the various components of the ecosystem. Study results demonstrate the total dependence of the South Florida ecosystem on the hydroperiod. Canal drainage of upland wetlands which include cypress swamps and wet-prairies effected a 10 fold decrease in primary productivity. Drainage also effected a thinning of the forest canopy and induced a reduction in the rate of forest litter decomposition resulting in a buildup of litter as increased fuel sources for destructive wildfires.

6G. Escape, Rescue, and Survival

AD-780 599/7GA PC$4.50/MF$1.45
Operations Research Inc Silver Spring Md
ASSESSMENT OF MODIFICATIONS TO THE EXPERIMENTAL DISTRESS ALERTING AND LOCATING SYSTEM.
Final rept.,
E. Feinberg, P. Steen, D. McGregor, M. Cornell, and J. Brown. Dec 73, 108p USCG-D-73-74
Contract DOT-CG-31446-A

Descriptors: *Search and rescue, *Distress signals, Burst transmission, Position finding, Communication and radio systems, Radio links, Retransmission, Multiple access, Coding, Signals, Automatic, Feasibility studies, Modification, Very high frequency, Frequency modulation.
Identifiers: DALS(Distress Alerting and Locating Systems), Distress alerting and locating systems.

The report documents a study of modifications required to allow for the use of the experimental Distress Alerting and Locating System (DALS) as a preoperational SAR system. In particular, the following areas are addressed: Multiple access and false alarms in an attempt to prevent system saturation; Automatic deployment techniques for the user device (hand-held unit); Situation coding to describe emergency status of distressed vessel/person; The feasibility of a frequency modification for operation on an allocated safety and distress frequency; Repackaging techniques incorporating a non-destruct antenna, long shelf life batteries and a sealed (environmentally protected) case; and The desirability and feasibility of adding to the distress device an 'on-air' indicator and/or a 'response to your call' indication. (Author)

6H. Food

AD-780 813/2GA PC$3.25/MF$1.45
Army Natick Labs Mass Food Lab
DEHYDRATED SOUPS FOR USAF AIRCRAFT.
Technical rept.,
Harold Gorfien, Abdul R. Rahman, Edmund M. Powers, and Donald E. Westcott. Mar 74, 30p
Rept no. FL-187 USA-NLABS-TR-74-49-FL

Descriptors: *Soup, *Food processing, *Dehydrated foods, Aircraft, Flavor, Packaging, Storage, Contamination, Microorganisms.
Identifiers: Food contamination.

Laboratory tests were conducted on dehydrated soups for the development of soups for use aboard aircraft operating above 15,240 meters (50,000 feet). These tests involved storage studies on seven different commercially available soups after repacking in flexible packages under vacuum. All seven soup products were rehydratable in 65.6C water and remained relatively stable when stored at 21.1C for one year. All soups packed under vacuum were acceptable in all quality characteristics when stored for three months at 37.8C. None of the soups had acceptable flavor when stored for six months and twelve months at 37.8C. Oxidation data show that the change in flavor from what may be considered acceptable to unacceptable (rating below 5.0) of all vacuum packed soup products during storage for twelve months at 37.8C correlates well with the reduction in oxygen level in the soup package. All soup products rehydrated with 65.6C water meet microbiological requirements. The dehydrated soups recommended for this test are spring vegetable, green pea, cream of chicken, onion, chicken noodle and cream of mushroom. (Modified author abstract)

N74-21741/5GA PC$13.25/MF$1.45
Massachusetts Inst. of Tech., Cambridge. Dept. of Nutrition and Food Science.
MECHANISMS OF DETERIORATION OF NUTRIENTS.
Annual Report, 13 Mar. 1973 - 13 Mar. 1974.
M. Karel, and J. M. Flink. 13 Mar 74, 204p NASA-CR-134247
Contract NAS9-12485

Descriptors: *Freeze drying, *Frozen foods, *Production engineering, *Space flight feeding, Dehydrated food, Polysaccharides, Proteins, Quality control, Taste.

For abstract, see STAR 1213

PATENT-3 153 659 Not available NTIS
Department of Agriculture, Washington, D.C.
CAFFEOYL GLYCERIDES.
Patent,
Harold G. C. King. Filed 30 Jul 63, patented 20 Oct 64, 2p PAT-APPL-298 807,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Glycerides, *Aralkyl acid esters, *Antioxidants, Food additives, Aliphatic acid esters, Synthesis(Chemistry).
Identifiers: PAT-CL-260-410-8, Cinnamic acid/3-4-dihydroxy-(triester-with-glycerol), Cinnomic acid/3-4-dihydroxy-(ester-with-glycerol), Cinnamic acid/3-4-dihydroxy-(diester-with-palmitoglycerol).

The invention relates to compounds having antioxidant activity, for the stabilization of foodstuffs, feeding stuffs, fats, and oils against undesirable oxidative changes. The compounds include mono-(dicarbomethoxy caffeoyl) glycerol, di-(dicarbomethoxy caffeoyl) mono palmitin, tri(dicarbomethoxy caffeoyl) glycerol.

PATENT-3 549 619 Not available NTIS
Department of Agriculture, Washington, D.C.
METHOD FOR THE PREPARATION OF AMYLOSE ACETATE DISPERSIONS.
Patent, *Filed 2 Apr 69, patented 22 Dec 70,
Arthur M. Mark, and Charles L. Mehltretter. 22 Dec 70, 4p PAT-APPL-812 926,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Dispersions, *Food coatings, *Amyloses, *Acetates, Films, Acetylation, Starches, Tensile strength, Flexibility, Transparence, Solubility, Granular materials, Food packaging.
Identifiers: PAT-CL-260-233-5.

The patent concerns the preparation of water-soluble food packaging films cast from aqueous dispersions of high-amylose corn starch acetates. The acetates were produced in granule form by acetylating high-amylose corn starch with acetic anhydride in a mixer at 90 to 95C for 30 minutes using 1.5 percent sodium hydroxide (based on dry starch) as catalyst. The granules are disintegrated by steam jet cooking and the resulting aqueous dispersion used for the preparation of transparent, strong, flexible, and water-soluble film.

PATENT-3 553 196 Not available NTIS
Department of Agriculture, Washington, D.C.
HIGH-AMYLOSE STARCH ACETATE.
Patent, *Filed 10 Jul 69, patented 5 Jan 71,
Arthur M. Mark, and Charles L. Mehltretter. 5 Jan 71, 4p PAT-APPL-855 439,
Previously filed as PAT-APPL-812 926, 2 Apr 69.
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Amyloses, *Acetates, *Food coatings, Films, Flexibility, Solubility, Starches, Food packaging, Acetylation, Transparence, Granular materials, Dispersions, Tensile strength.
Identifiers: PAT-CL-260-233-5.

The patent describes the preparation of water-soluble food packaging films, cast from aqueous dispersions of high-amylose corn starch acetates. The acetates were produced in granule form by acetylating high-amylose corn starch with acetic anhydride in a mixer at 90 to 95C for 30 minutes using 1.5 percent sodium hydroxide (based on dry starch) as catalyst. The granules are disintegrated by steam jet cooking and the resulting aqueous dispersion used for the preparation of transparent, strong, flexible, and water-soluble film.

PATENT-3 579 352 Not available NTIS
Department of Agriculture, Washington, D.C.
EXTRUDER-COOKED CEREAL ENDOSPERM PARTICLES AND INSTANT BEVERAGE MIXES COMPRISING THE SAME.
Patent, *Filed 31 Oct 68, patented 18 May 71,
George N. Bookwalter, Howard F. Conway, and Edward L. Griffin, Jr. 18 May 71, 3p PAT-APPL-772 380,
Government-owned invention available for licensing. Copy of Patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Grains(Food), *Beverages, Cereal products, Food processing, Mixtures.
Identifiers: PAT-CL-99-78.

The invention relates to the discovery that starch cereal grain endosperms including those of corn, rye, sorghum, rice, etc., that have been briefly cooked in a screw extruder provide palatable, non-gritty beverages that do not thicken on standing. Cereal grain endosperms having a moisture content of 10-20% are heated at 325-400 F. in a screw-type extruder at a pressure of 2000-4000 p.s.i. The ejected material is milled to privide a cold water soluble product which is combined with soybean flour, nonfat dry milk solids, sugar, salt, minerals and vitamins to form an instant beverage mix.

PATENT-3 585 047 Not available NTIS
Department of Agriculture, Washington, D.C.
ENZYMATIC IMPROVEMENT OF SOYBEAN FLAVOR AND STABILITY.
Patent, *Filed 30 Oct 68, patented 15 Jun 71,
Masao Fujimaki, Soichi Aria, and Michiko Yamashita. 15 Jun 71, 3p PAT-APPL-772 039,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Soybeans, *Food processing, *Enzymes, *Patents, Flavor, Stability.
Identifiers: PAT-CL-99-98.

The patent concerns the removal of the enzymatically liberated objectionable taste and oxidation susceptible constituents by washing with aqueous ethanol. This provides stabilized soybean materials having little if any astringent and beany flavor and a distinctly diminished tendency to flavor reversion.

PATENT-3 634 475 Not available NTIS
Department of Agriculture, Washington, D.C.
METHOD FOR REMOVING METALS FROM VEGETABLE OILS.
Patent, *Filed 18 Sep 69, patented 11 Jan 72,
Robert E. Beal, and Roger A. Eisenhauer. 11 Jan 72, 3p PAT-APPL-859 199,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Vegetable oils, *Washing, Purification, Flavor, Metals, Ion exchanging, Sodium, Iron, Copper, Nickel.
Identifiers: PAT-CL-260-428, Countercurrent washing.

The invention is an improved low-cost continuous method for reducing the quantity of certain metals in vegetable oils intended for edible use, to near or below the levels where these metals adversely affect the flavor of the oil or the ability of the oil to resist oxidation. The method consists in washing the vegetable oil in a multistage countercurrent manner with water which has previously been treated by passing it through a layer of a cation-exchange resin in the hydrogen form. After it has passed through the continuous countercurrent washing process, the water is again entirely passed through the resin layer and reused for washing a further quantity of oil. The same quantity of water is thus recycled and reused indefinitely.

PATENT-3 639 129 Not available NTIS
Department of Agriculture, Washington, D.C.

PRODUCTION OF VEGETABLE PROTEIN BEVERAGE BASE.
Patent, *Filed 9 Apr 70, patented 1 Feb 72,
Gus C. Mustakas, William J. Albrecht, and George N. Bookwalter. 1 Feb 72, 4p PAT-APPL-27 184,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Beverages, *Proteins, *Foods, Vegetables, Soybeans, Nutritine value.
Identifiers: PAT-CL-99-64.

The invention relates to the production of a protein food product that has as its prime object the ability to easily mix with water to give a beverage having high nutritive value, pleasant flavor, and good mouthfeel. A secondary object is to provide a food supplement with a long shelf life.

PB-232 673/4GA MF$1.45
National Research Council, Washington, D.C. Committee on Food Protection.
TOXICANTS OCCURRING NATURALLY IN FOODS (SECOND EDITION).
Nov 73, 630p* ISBN-0-309-02117-0
Paper copy available from National Academy of Sciences, Printing and Publishing Office, 2101 Constitution Ave, Washington, D.C. 20418 $10.50.

Descriptors: *Toxicology, *Food, Neoplasms, Phenols, Nitrate minerals, Nitrites, Grace elements, Vitamins, Radioactivity, Potassium, Sodium chloride, Proteins, Peptides, Estrogens, Seafood, Glycosides, Toxins and antitoxins, Food additives, Food adulteration, Food contamination.

The valuable reference work for the benefit of all those concerned with the natural toxicologic hazards in man's food supply contains new information and updated material. It is comprised of 26 chapters authored by recognized authorities in the field. To the extent feasible, the subject matter is organized on the basis of the chemical nature of the materials considered. Areas of discussion include the chemistry of nitrates and nitrites, the toxic potential of trace elements occurring in foods, natural radiation exposures arising from dietary intake, the toxicity of vitamins and the significance of plant phenols as present or potential toxicants in human foods. The information presented in addressed primarily to public health workers, nurses, nutritionists, medical and paramedical personnel, regulatory agencies, food technologists, and the food industry. While the book is technical in nature, the text has been made as intelligible to nonspecialists as is feasible.

6J. Industrial (Occupational) Medicine

AD-781 147/4GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
ALLERGENIC PROPERTIES OF DUST IN COTTON AND LINEN SPINNING MILLS,
A. A. Fetisova, S. M. Titova, and O. G. Aleksandrova. 17 Jun 74, 10p Rept no. FTD-HT-23-1464-74
Edited trans. of Gigiena Truda i Professionalnye Zabolevaniya (USSR) v14 n5 p19-22 May 70, by Dean F. W. Koolbeck.

Descriptors: *Dust, *Spinning(Industrial processes), *Cotton textiles, *Linen, Industrial medicine, Allergic diseases, USSR, Translations, Bacteria, Fungi.
Identifiers: *Allergens, *Textile industry, Indoor air pollution, Industrial hygiene.

Investigations included cutaneous scarification tests in workers of cotton- and flax-spinning mills, anaphylaxia with desensitization experiments in guinea pigs, along with staging of intradermal and scarification tests in sensitized animals, wherefrom the following inferences ensew: Industrial dust of cotton- and flax-spinning mills is an allergen; positive skin tests are recorded not only in patients with impaired bronchopulmonary system but also in practically healthy subjects, which, apparently, is indicative of a latent nature of the allergy; antigenic properties of the industrial dust are due to the presence therein of bacteria and fungi; there is an affiliation between the dust generated at cotton and flax-spinning mills, conditioned by the homogeneity of the fungal and bacterial flora.

PB-232 777/3GA PC$3.25/MF$1.45
National Inst. for Occupational Safety and Health, Cincinnati, Ohio.
LEAD EXPOSURE AT AN INDOOR FIRING RANGE.
Final rept. Mar-Aug 73,
Thomas L. Anania, James B. Lucas, and Joseph A. Seta. 1974, 32p* NIOSH-TR-207-74
DHEW/NIOSH-74-100

Descriptors: *Hazardous materials, *Industrial medicine, *Lead inorganic compounds, Toxicity, Criteria, Inspection, Standards, Recommendations, Industrial hygiene, Firing tests(Ordinance), Small arms, Small arms ammunition, Fumes.
Identifiers: *Occupational Safety and Health Act of 1970, *Toxic hazards, Indoor air pollution.

An industrial hygiene and medical survey was conducted at the Police Indoor Firing Range in Orlando, Florida. The purpose of the survey was to determine if a potential health hazard existed from lead exposure during firing and to evaluate existing evnironmental controls. Based on environmental and medical findings, it was determined that a potential health hazard due to inorganic lead exposure existed. Recommendations were made to alleviate the existing conditions and to control lead fumes generated at the firing line.

PB-232 805/2GA PC$5.75/MF$1.45
Michigan Univ., Ann Arbor.
AN EVALUATION OF THE EFFECTS OF CHRONIC MERCURY EXPOSURES ON EMG AND PSYCHOMOTOR FUNCTIONS.
Final rept. May 71-Jan 73,
D. B. Chaffin, B. D. Dinman, J. M. Miller, R. G. Smith, and D. H. Zontine. Jan 73, 213p* NIOSH-TR-208-74
Contract HSM-099-71-62

Descriptors: *Hazardous materials, *Industrial medicine, *Mercury inorganic compounds, Toxicity, Criteria, Inspection, Standards, Recommendations, Industrial hygiene, Electromyography, Psychomotor tests, Exposure, Evaluation, Neurology, Industrial atmospheres.
Identifiers: *Occupational Safety and Health Act of 1970, *Toxic hazards.

The report is a cross-sectional study involving both neurological and psychomotor skill assessments of 142 industrial workers from four different plants. None of the workers reported being clinically ill from mercury at the time of the study. Seventy seven of the workers were routinely exposed to inorganic mercury vapor in the course of their jobs. The primary health status indicators employed in the study were: forearm tremor, surface electromyography and discrete positioning eye-hand coordination. Psychomotor tests and clinical neurological examinations were included in the study. The statistical findings of the study are used as the basis for a recommendation that specific quantitative neurological and psychomotor tests, such as those described in the study, be used in industrial medical departments to routinely evaluate the health of workers exposed to inorganic mercury.

PB-233 098/3GA PC$8.00/MF$1.45
National Inst. for Occupational Safety and Health, Rockville, Md.
CRITERIA FOR A RECOMMENDED STANDARD: OCCUPATIONAL EXPOSURE TO SULFURIC ACID.
Final rept.,
1974, 100p DHEW/NIOSH-74-128, NIOSH-TR-213-74
Contract HSM-99-72-116

Descriptors: *Hazardous materials, *Industrial medicine, *Sulfuric acid, Toxicity, Criteria, Inspection, Standards, Recommendations, Industrial hygiene, Industrial atmospheres, Gases.
Identifiers: *Occupational Safety and Health Act of 1970, *Toxic hazards, Air quality.

The report presents the criteria and the recommended standard based thereon which were prepared to meet the need for preventing occupational diseases arising from exposure to sulfuric acid. The proposed standard applies to the processing, manufacture, and use of sulfuric acid, or its release as an intermediate, byproduct, or impurity as applicable under the Occupational Safety and Health Act of 1970. These criteria were not designed for the population-at-large and any extrapolation beyond general occupational exposures is not warranted. These criteria were developed to ensure that the standard based thereon would protect against development of acute and chronic sulfuric acid poisoning, be measurable techniques that are valid, reproducible, and available to industry and governmental agencies, and be attainable with existing technology.

6K. Life Support

AD-780 663/1GA PC$3.00/MF$1.45
Navy Experimental Diving Unit Washington D C
DESIGN MODIFICATION TO AQUA-LUNG DEMAND REGULATOR.
Final rept.,
F. Krasic. 6 Mar 57, 22p Rept no. NEDU-Evaluation-19-57

Descriptors: *Breathing apparatus, *Diver equipment, *Pressure regulators, Respiration, Naval research.
Identifiers: *Underwater breathing equipment, Recommendations, Evaluation, *Scuba regulators.

The report covers the evaluation of locally modified Aqua-Lung Regulator compared to the standard aqua-lung regulator to determine the suitability of the modified apparatus for Naval service. The regulators were tested objectively by breathing machine runs with instrumentation for respiratory pressure, respiratory minute volume, and breathing rate. Breathing machine runs are summerized as graphs of peak respiratory pressure versus depth and cylinder pressure. The results are discussed constructively and lead to the recommendation that the modification be included in aqua-lung apparatus used in the Naval service. (Modified author abstract)

AD-780 664/9GA PC$3.00/MF$1.45
Navy Experimental Diving Unit Washington D C
THE DESIGN OF AN ADJUSTABLE BREATHING BAG EXHAUST VALVE FOR CLOSED AND SEMI-CLOSED CIRCUIT SCUBA.
Research rept.,
W. F. Fischer, C. J. Leyden, and W. F. Searle, Jr. 5 Mar 58, 24p Rept no. NEDU-RR-4-58

Descriptors: *Diver equipment, *Breathing apparatus, *Exhaust valves, Reliability, Safety valves, Pressure breathing, Mechanical drawings, Hose fittings, Scuba diving.

Existing closed and semi-closed circuit scuba breathing bag exhaust or relief valves were studied with the object of developing a standard U.S. Navy valve. A Canadian relief valve proposed as a substitute for the British CDBA relief valve was also studied. The latter valve (CDBA) was used as a starting point, and redesigned to provide a range of relief adjustment from approximately 0.4 to 2.85 psi. A relatively secure, manually operated dump knob which permits rapid purging of the breathing bag is provided. A hand-made, modified valve was

tested and found to be superior to the available models. Detailed manufacturing drawings of the modified valve, including several design refinements such as non-magnetic materials and improved fittings, are submitted with the recommendation that prototypes be procured and field tested. (Author)

AD-780 666/4GA PC$3.00/MF$1.45
Navy Experimental Diving Unit Washington D C
MOUTHPIECE MOUNTED CHECK VALVES FOR DEMAND TYPE DIVING APPARATUS.
Final rept.,
W. F. Searle, Jr., and C. J. Leyden. 27 Jun 57, 17p
Rept no. NEDU-Evaluation-20-57

Descriptors: *Diver equipment, *Valves, *Breathing apparatus, Reliability, Pressure breathing, Air flow.

The evaluation was made to determine the most suitable mouthpiece mounted check valves available commercially, and if necessary, to develop modifications to commercial equipment to obtain an optimum set of valves embodying the advantages of the various models investigated. Breathing machine results upon the various components selected are summarized to tables of peak respiratory pressure against depth. A proposed standard mouthpiece is designed and presented with the recommendations that several be procured for further evaluation. (Modified author abstract)

AD-780 746/4GA PC$3.25/MF$1.45
Navy Experimental Diving Unit Washington D C
EVALUATION OF REVISED BAR-WAY DIVER'S AIR HOSE COUPLING.
Final rept.,
W. F. Searle, Jr., and F. G. Jensen. 15 May 57, 37p
Rept no. NEDU-Evaluation-21-57

Descriptors: *Diver equipment, *Breathing apparatus, *Hose couplings, Reliability, Wear resistance, Air flow.

A diver's air hose coupling is evaluated for the determination of its acceptability as a substitute for or replacement of the Standard Navy clamp type diver's air hose coupling. Extensive hydrostatic, tension and cyclic work tests, as well as destructive tests for internal examination, were conducted. The coupling is found to have a slight advantage over the Standard one in ease of handling. (Modified author abstract)

AD-780 747/2GA PC$3.00/MF$1.45
Navy Experimental Diving Unit Washington D C
DEVELOPMENT AND EVALUATION OF A STANDARD U. S. NAVY TWO CYLINDER SCUBA HARNESS,
W. F. Searle, Jr., and H. A. Brandenburg. 4 May 59, 24p Rept no. NEDU-Evaluation-23-59

Descriptors: *Diver equipment, *Breathing apparatus, *Harnesses, Reliability, Scuba diving, Nylon, Straps, Fastenings.

A simple scuba harness for two cylinder scuba, as initially developed by U.S. Naval School, Underwater Swimmers, was improved and given evaluation. The harness, with adequate hardware and special nylon webbing, is reported highly satisfactory and is recommended for adoption as a Standard U.S. Navy Scuba Harness. (Modified author abstract)

AD-780 748/0GA PC$3.00/MF$1.45
Navy Experimental Diving Unit Washington D C
TEST OF DIVER'S NON-RETURN VALVE CONTAINING KEPNER PRODUCTS CARTRIDGE INSERT.
Final rept.,
J. V. Harter, and Richard Garrahan. 14 Oct 65, 13p
Rept no. NEDU-Evaluation-6-65

Descriptors: *Diver equipment, *Valves, *Breathing apparatus, Air flow, Pressure breathing, Deep diving.

Five diver's non-return valves for use with standard air and helium hard-hat diving were provided in response to specifications provided by Navy Experimental Diving Unit. The ability of the valves to seat at low pressure differentials after many cycles of operation, lack of valve clatter, and ability to pass the required air flow were satisfactorily demonstrated in a series of laboratory and operational tests. (Modified author abstract)

6L. Medical and Hospital Equipment

AD-780 699/5GA PC$3.25/MF$1.45
Wheeler Industries Inc Washington D C
DESIGN CRITERIA FOR SHIPBOARD DENTAL SPACES.
Technical rept. Feb-Jun 74,
Francis B. Merkle. Jun 74, 43p
Contract N00014-73-C-0179
See also report dated Jan 74, AD-774 936.

Descriptors: *Dentistry, Shipboard, Drawings, Sterilization, Facilities, Laboratories.
Identifiers: *Dental equipment, Design criteria.

The functional design requirements of the Bureau of Medicine and Surgery for the following types of shipboard dental spaces are presented: Dental administrative office; dental officer's office and consultation room; dental patient waiting room and instruction center; dental linen issue room. The technical report takes into account the existing equipment limitations and shipboard constraints. Using the present state-of-the-art as a baseline, an outline of an R and D program will be developed. Accomplishment of such a program is expected to reduce or to eliminate, in future ships, the effects of the existing equipment limitations and shipboard constraints. The R and D program will be developed as the design criteria are worked out and will be incorporated in the final report. (Modified author abstract)

AD-780 963/5GA PC$3.00/MF$1.45
Texas A and M Univ College Station Dept of Veterinary Microbiology
JET INJECTION IN LARGE ANIMAL MEDICINE. JET INJECTOR EVALUATION.
Rept. no. 12 (Annual), 1 Jun 73-31 May 74,
Stewart McConnell, H. W. Whitford, and L. C. Grumbles. 14 Jun 74, 14p
Contract DADA17-71-C-1087
See also rept. no. 8, AD-767 399.

Descriptors: *Immunization, *Injections(Medicine), *Medical equipment, Vaccines, Veterinary medicine, Response(Biology).
Identifiers: Jet injections, Evaluation.

During the course of the contract the authors have defined the physical components in relation to the animals tested, determined the efficacy of jet injection in relation to the biological effectiveness of live antigen on a host animal, compared the relative efficacy of jet injected antigens with those administered by needle and syringe and made recommendations on improvements of existing equipment. (Modified author abstract)

COM-74-11126/1GA PC$20.00/MF$20.00
National Technical Information Services, Springfield, Va.
BIOCOMPATIBLE MATERIALS. A BIBLIOGRAPHY WITH ABSTRACTS.
Rept. for 1964-May 74,
Pernell W. Crockett. Jul 74, 165p* NTIS-WIN-74-050

Descriptors: *Bibliographies, Fabrication, Materials, In vivo analysis, Mechanical organs, Implantation, Medical supplies, Surgery, Tissues(Biology), Blood.
Identifiers: *Biomaterials, Blood compatible materials, Tissue compatible materials.

The bibliography contains 160 selected abstracts of research reports retrieved using the NTIS online search system--NTISearch. The cited reports cover studies on the fabrication and preparation of biomaterials, and the in vivo evaluation of the compatibility of these materials to tissues and blood components. Use of the materials in mechanical organs, implants, and surgical materials is discussed.

N74-21701/9GA PC$4.00/MF$1.45
Techtran Corp., Glen Burnie, Md.
METHOD FOR RAPID DETERMINATION OF TRANSPORT PARAMETERS OF CO2 IN MAN USING THE CAPNOGRAPH AND MULTICHANNEL RESPIRATORY MASK.
A. M. Shmeleva, I. S. Breslav, and B. N. Volkov.
May 74, 10p NASA-TT-F-15443
Contract NASW-2485
Tran-Transl. Into English from Fiziol. Zh. Sssr (Moscow), V. 59, No. 7, Jul. 1973 p 1139-1143.

Descriptors: *Carbon dioxide tension, *Gas analysis, *Human body, *Pulmonary functions, Bioinstrumentation, Exhalation, Gas transport, Masks, Respiratory physiology, Respirometers.

For abstract, see STAR 1213

PAT-APPL-412 496 PC$5.25/MF$1.45
Department of Health, Education, and Welfare, Bethesda, Md. Patent Branch.
EPILEPTIC SEIZURE WARNING SYSTEM.
Patent Application,
Sam S. Viglione, Vladimir A. Ordon, Willian B. Martin, and Carl C. Kesler, Jr. Filed 2 Nov 73, 42p
DHEW-K-111-73
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Epilepsy, *Warning systems, *Patent applications, Convulsive disorders, Medical equipment.

The patent application relates to epileptic seizure warning system based on pattern recognition principles. The system is embodied in a small self-contained device which can be carried in a pocket of a person subject to grand mal seizures, to monitor the person's condition and provide sufficient advance warning of any imminent seizure so that the person can take preventive medication or lie down to prevent or minimize any harmful seizure effects.

PATENT-3 795 020 Not available NTIS
Department of the Air Force Washington D C
PORTABLE, FOLDING TRAY RETAINER AND STAND (MULTIPURPOSE).
Patent,
Hans B. Bartholomew, and Maureen A. Hunt.
Filed 23 May 72, patented 5 Mar 74, 7p Rept nos.
PAT-APPL-256 067,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Supports, *Medical equipment, Stretchers, Mounts, Human factors engineering.
Identifiers: PAT-CL-5-332, *Trays.

The invention relates generally to the field of service tray supports and, in particular, to an improved combined portable tray support and stand especially adaptable for use with a litter-borne patient.

PATENT-3 802 419 Not available NTIS
Department of the Air Force Washington D C
RESPIRATION MONITOR.
Patent,

John W. Yates. Filed 11 Apr 72, patented 9 Apr 74, 8p Rept nos. PAT-APPL-242 998,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D. C. 20231 $0.50.

Descriptors: *Patents, *Respiration, *Plethysmography, Medical equipment, Monitors, Electrical impedance, Thorax.
Identifiers: PAT-CL-128-2-1-R.

The invention discusses how respiration is monitored by measuring a subject's impedance by impressing an oscillator-controlled constant current source upon the subject. The output is fed to a differential amplifier, bandpass filtered, and full wave rectified. The differential amplifier can be switched to be fed by separate electrodes on the subject and not connected to the constant current source.

PB-232 784/9GA PC$5.00/MF$1.45
Battelle Memorial Inst., Columbus, Ohio. Columbus Labs.
EVALUATION OF THE IMPLEMENTATION OF A MEDICAL INFORMATION SYSTEM IN A GENERAL COMMUNITY HOSPITAL: VOLUME I. SUMMARY AND STUDY STRUCTURE AND METHODOLOGY.
Interim rept. 27 Nov 72-31 Aug 73,
30 Sep 73, 152p* BHSR-74-35
Contract HSM-110-73-331
See also PB-232 785.

Descriptors: *Information systems, *Hospitals, *Medical records, Evaluation, Medical services, Benefit cost analysis, Data processing.
Identifiers: *Biomedical information systems, Health services research and development, Hospital administration.

The interim report presents results to date of an ongoing evaluative study of Technicon's hospital information system implemented at El Camino Hospital, Mountain View, California. Originally, it was intended as a report giving final evaluation results of a computer system that handles much of the information flow in a community hospital. However, the phased implementation of the system at El Camino Hospital was not completed until October, 1972. As a result, the evaluators were able to collect only pre- and early post-implementation data. It is clear that these two sets of data are insufficient to support definitive conclusions, and for this reason the study is continuing for at least an additional eighteen months. This interim report is intended only to document the findings to date, and to refine the evaluation methodologies where indicated.

PB-232 785/6GA PC$7.50/MF$1.45
Battelle Memorial Inst., Columbus, Ohio. Columbus Labs.
EVALUATION OF THE IMPLEMENTATION OF A MEDICAL INFORMATION SYSTEM IN A GENERAL COMMUNITY HOSPITAL: VOLUME II. EVALUATION STUDIES AND ANALYSES.
Interim rept. 27 Nov 72-31 Aug 73,
30 Sep 73, 346p* BHSR-74-36
Contract HSM-110-73-331
See also PB-232 784.

Descriptors: *Information systems, *Hospitals, *Medical records, Evaluation, Medical services, Benefit cost analysis, Manpower, Data processing.
Identifiers: *Biomedical information systems, Health services research and development, Hospital administration.

The interim report presents the current information on the evaluation of the impact of the implementation of the Technicon Medical Information System (MIS) at El Camino Hospital (ECH) in Mountain View, California. The demonstration and evaluation project is not completed. However, the report provides a comprehensive documentation of the evaluation effort to date. The report has been prepared in two volumes. This volume (Evaluation Studies and Analyses) is the second of the two volumes and provides the detailed information on the studies and analyses being conducted in the evaluation effort. The sections of this volume are organized according to the several impact areas. The detailed description of the methodology for the various study areas are included in this volume.

PB-233 099/1GA PC$3.00/MF$1.45
Health Resources Administration, Rockville, Md. Div. of Facilities Utilization.
HOW TO PLAN AND DESIGN INTENSIVE CORONARY CARE UNITS, OUTPATIENT AND EMERGENCY UNITS,
E. Todd Wheeler, Barbara J. Bregande, Robert W. Fleming, and Reinald Leidelmeyer. Oct 73, 18p* DHEW/HRA-74-4007

Descriptors: *Hospitals, *Medical services, Design, Planning, Outpatient clinics, Efficiency, Human factors engineering.
Identifiers: Coronary care units, Hill-Burton projects, Intensive care units, Emergency care units.

The paper presents a method of establishing the proper sizes of four hospital departments, an intensive-care unit, a coronary-care unity, an ambulant-patient department and an emergency unit, all for a hypothetical 375-bed acute general hospital, located in a city of one million population, with 15 other hospitals, including a city-county hospital and three medical-school hospitals. There are three main steps in determining the sizes of these units: the functional program, the architectural program, and schematic plans.

6M. Microbiology:

AD-780 982/5GA Reprint
Naval Medical Field Research Lab Camp Lejeune N C
'UREAPLASMA UREALYTICUM' GEN. NOV., SP. NOV: PROPOSED NOMENCLATURE FOR THE HUMAN T (T-STRAIN) MYCOPLASMAS.
Medical research progress rept. no. 2,
M. C. Shepard, C. D. Lunceford, D. K. Ford, R. H. Purcell, and D. Taylor-Robinson. 1974, 15p
Reprinted as Naval Medical Field Research Lab. Volume 24, Number 12, June 1974.
Availability: Pub. in International Jnl. of Systematic Bacteriology, v24 n2 p160-171 Apr 74.

Descriptors: *Mycoplasma, Biosynthesis, Urease, Urea, Enzymes, Hydrolysis, Biochemistry, Taxonomy.
Identifiers: Ureaplasma urealyticum, Mycoplasma T strain.

The biological properties and special characteristics of the human T mycoplasmas have been reviewed and summarized. The T mycoplasmas are distinguished from all other known mycoplasmas by their porduction of urease, and, therefore, by their ability to hydrolyze urea. This singular property significantly sets the T mycoplasmas apart from all other members of the order Mycoplasmatales. In consideration of this distinguishing property, it is reasonable to propose establishing a new, separate genus in the family Mycoplasmataceae in which to classify the T mycoplasmas isolated from man and lower animals. The Ureaplasma is proposed for this new genus, which at present contains a single human species of at least eight different serotypes. The name Ureaplasma urealyticum is proposed for this new species. The type strain of U. urealyticum is human strain 960-(CX8), serotype VIII (Black); it has been deposited in the American Type Culture Collection as ATCC 27618. (Author)

AD-781 011/2GA PC$4.00/MF$1.45
Army Foreign Science and Technology Center Charlottesville Va
PRODUCING A STABLE TOXIN CLOSTRIDIUM SEPTICUM FROM A HORSEMEAT CULTURE (POLUCHENIE STAVILNOGO TOKSINA CLOSTRIDYUM SEPTICUM V PITATELNOI SREDE IZ KONSKOGO MYACA),
L. Bergoltseva. 15 Oct 72, 7p Rept no. FSTC-HT-23-2302-72
Trans. of Voprosy Proizvodstva Vaktsin i Syvorotok (USSR) v1 p62-66 1968.

Descriptors: *Toxins and antitoxins, Bacteria, Clostridium, Production, Preparation, Culture media, Equines, Meat, USSR, Translations.
Identifiers: *Clostridium septicum.

In preliminary experiments, the possibility of preparing the toxin Cl. septicum from a culture medium of horsemeat has been established, after which research was carried out on preparing the optimal culture medium. Different variants of nutritive media were prepared from acid hydrolysates of cooked and uncooked horsemeat; a method of processing the meat before hydrolysis was worked out; and the conditions for preparing the hydrolysates were changed. Hydrolysis was carried on in an open pot and at different pressures. The media that were prepared from hydrolysates differed in their proportions of the quantity of hydrolysates and the amount of beef and horsemeat broth that was added. In short, a technique was worked out for preparing a nutritive medium consisting of an acid hydrolysate and horsemeat broth. The influence of the length of growth, temperature, source of carbon food, and uterine culture on the toxigenesis of Cl. septicum, as well as the antigen structure and other properties of the toxin obtained was studied.

AD-781 055/9GA Not available NTIS
National Research Council of Canada Halifax (Nova Scotia) Atlantic Regional Lab
PRODUCTION OF BIKAVERIN BY 'FUSARIUM OXYSPORUM' AND ITS IDENTITY WITH LYCOPERSIN,
D. Brewer, G. P. Arsenault, J. L. C. Wright, and L. C. Vining. 6 Sep 73, 5p NRC-13383
Availability: Pub. in The Jnl. of Antibiotics (Japan Antibiotics Research Assoc.) v26 n12 p778-781 Dec 73.

Descriptors: *Fusarium, *Antibiotics, *Fungi, Japan, Biosynthesis, Drugs.
Identifiers: *Bikaverin, *Lycopersin, Fusarium oxysporum.

The presence of a wine-red antiprotozoal metabolite in cultures of G. fujikuroi (F. moniliforme) and another Fusarium species was first described in 1970 by Balan and coworkers. Subsequently, Kjaer, Bu'lock and their collaborators, after extensive chemical investigations, have identified this substance with bikaverin, a fungal vacuolation factor discovered by Park and coworkers in aging cultures of F. oxysporum and F. oxysporum f. sp. lycopersici. Chemical and X-ray crystallographic evidence established the structure of bikaverin as I. Its resemblance to, and spite some discrepancies in the reported properties, its probable identity with lycopersin was noted. The authors have compared samples of lycopersin and bikaverin directly and confirmed their identity.

AD-781 150/8GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
APPARATUS FOR THE STUDY OF BACTERIAL AND VIRUS AEROSOLS,
V. P. Zhalko-Titarenko. 17 Jun 74, 7p Rept no. FTD-HT-23-1284-74
Edited trans. of Patent (USSR) 135 596 p1-2 1961, by K. L. Dion.

Descriptors: *Aerosols, *Viruses, *Bacteria, *Bioinstrumentation, Samplers, Instrumentation, USSR, Translations, Patents.

Currently known apparatuses for the study of bacterial and virus aerosols do not guarantee that the

aerosol structure will be constant as the specimen is taken, do not permit more than 3-4 samplings are applicable to only one form of study and are not sufficiently safe in operation. The apparatus proposed for study of bacterial and virus aerosols is free from these drawbacks. The apparatus ensures that the aerosol structure will be constant as the specimen is taken, allows multiple samplings without a change in the aerosol structure, is universal and safe in operation.

AD-781 151/6GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
CHARACTERISTICS OF THE CHEMICAL NATURE OF CERTAIN BACTERIAL ALLERGENS,
K. S. Zobnina, I. V. Mukhin, and A. S. Avtonomova. 19 Jun 74, 7p Rept no. FTD-HT-23-1469-74
Edited trans. of mono. Allergiya i Reaktivnost Organizma Materialy Pervogo Vsesoyuznogo Simpozyuma, n.p., 1969, v2 p7-9, by Dean F.W. Koolbeck.

Descriptors: *Antigens, *Bacteria, Chemical properties, Infectious diseases, Bacterial diseases, Sensitivity, Streptococcus, USSR, Translations.
Identifiers: Allergens, Streptococcus hemolyticus.

Bacterial allergy has an important role in the pathogenesis of many infectious diseases. Determination of heightened sensitivity of the organism to various microbe species is hampered by the absence of unified methods of producing qualitatively heterogenic preparations which are applicable for diagnosis of bacterial allergy. In connection with this the question of the biochemical decoding of allergens, identifying localization of the active principle in a certain chemical substance, and the possibility of isolating it in pure form represent substantial theoretical and practical interest. Investigations of the chemical composition of allergens from Streptococcus hemolyticus are reported.

AD-781 172/2GA PC$4.00/MF$1.45
Army Foreign Science and Technology Center Charlottesville Va
INFLUENCE OF TRINITROTOLUENE ON MICROORGANISMS AND BIOCHEMICAL SELF-PURIFICATION PROCESSES IN WATER,
Ts. I. Rogovskaya. 18 Jul 73, 13p Rept no. FSTC-HT-23-20-74
Trans. of Mikrobiologiya (USSR) v20 n3 p265-272 1951.

Descriptors: *Sewage, *TNT, *Microorganisms, Biochemistry, Decomposition, Sewage disposal, Reservoirs, Purification, Aquatic animals, Toxicity, USSR, Translations.
Identifiers: *Industrial wastes.

When industrial wastes get into a natural reservoir, sewage containing trinitrotoluene changes the biological and physical-chemical conditions in the reservoir, inhibits self-purification processes, and makes the reservoir unsuitable as a supply of drinking water. Almost no light has been thrown on the influence of trinitrotoluene on aqueous microorganisms and biochemical self-purification processes in water. Only the study of Ruchoff et al, who studied purification of domestic sewage by physical-chemical and biological methods after trinitrotoluene had been added, contains indications that trinitrotoluene not only inhibits and reduces the rate of self-purification of the reservoir's water but also does not decompose under the influence of biological agents. The authors also indicate that a trinitrotoluene concentration of 5 mg/l is fatal for fish.

N74-21719/1GA PC$4.00/MF$1.45
Naval Biomedical Research Lab., Oakland, Calif.
EVIDENCE FOR METABOLIC ACTIVITY OF AIRBORNE BACTERIA.
Quarterly Status Report.
M. A. Chatigny, and H. Wolochow. 1 Feb 74, 16p NASA-CR-138187, QSR-4
NASA ORDER W-13450

Descriptors: *Aerosols, *Bacteria, *Glucose, *Metabolism, Air, Carbon dioxide, Carbon 14, Planetary quarantine.

For abstract, see STAR 1213

N74-22139/1GA PC$4.25/MF$1.45
Scientific Translation Service, Santa Barbara, Calif.
EXPERIMENTS AND OBSERVATIONS ON STERILIZATION OF THERMOLABILE OBJECTS WITH PERACETIC ACID.
M. Sproessig, H. Muecke, and R. Domnick. May 74, 23p NASA-TT-F-15572
Contract NASW-2483
Tran-Transl. Into English from Pharm. (West Ger.), V. 29, No. 2, 1974 p 132-137.

Descriptors: *Acetic acid, *Bactericides, *Sterilization, Antiseptics, Polyethylenes, Polystyrene, Polyvinyl chloride, Proteins, Rubber.

For abstract, see STAR 1213

PATENT-3 308 038 Not available NTIS
Department of Agriculture, Washington, D.C.
PROCESS OF MAKING SPORE-CONTAINING CULTURES OF JAPANESE BEETLE MILKY DISEASE BACTERIA.
Patent, *Filed 13 Nov 64, patented 7 Mar 67, Robert A. Rhodes, George R. Hrubant, and Margaret S. Roth. 7 Mar 67, 2p PAT-APPL-411 161,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Bacillus, Cultures(Biology), Growth, Bacteria, Insect control, Beetles.
Identifiers: PAT-CL-195-96, *Biological insect control, Popillia japonica, *Bacillus popilliae.

The invention relates to a commercially promising in vitro process for obtaining sporulated cell formation in agar plate colonies of Bacillus popillae. The in vitro-generated spores are capable of producing the fatal milky disease when injected into Japanese beetle larvae. This process may lead to extensive commercial in vitro production of viable, highly infective spores for the biological control of the Japanese beetle.

PATENT-3 565 763 Not available NTIS
Department of Agriculture, Washington, D.C.
NITROGEN SOURCE FOR IMPROVED PRODUCTIONS OF MICROBIAL POLYSACCHHARIDES.
Patent, *Filed 19 Dec 67, patented 23 Feb 71, Martin C. Cadmus, Marvin O. Bagby, Kermit A. Burton, and Ivan A. Wolff. 23 Feb 71, 2p PAT-APPL-691 708,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Polysaccharides, *Fermentation, *Thickeners(Materials), Bacteria, Plant fibers, Viscosity, Biosynthesis, Glucose, Hemp, Utilization.
Identifiers: PAT-CL-195-31, Xanthomonas campestris, Arthrobacter viscosus, *Kenat.

The patent describes fermentations of Arthrobacter viscosus NRRL B-1973 and other microbes such as Xanthomonas campestris that produce high viscosity polysaccharide gum thickeners, in an aqueous fermentation media containing glucose, inorganic salts, and as the sole nitrogen source kenaf of the waste raw juice expressed from the fibrous shafts of the subtropical plant, Hibiscus cannabinus, polysaccharide are produced having far higher viscosities than those of prior art fermentations.

PATENT-3 585 109 Not available NTIS
Department of Agriculture, Washington, D.C.
NOVEL PROCESS OF PRODUCING L(+)-TARTARIC ACID.
Patent, *Filed 3 Mar 69, patented 15 Jun 71, Koichi Yamada, Yasuji Minoda, Tohru Kodama, and Uichiro Kotera. 15 Jun 71, 2p PAT-APPL-803 957,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Fermentation, *Tartaric acid, Cultures(Biology), Biosynthesis, Optical activity, Bacteria, Pantothenic acid, Aerobic processes.
Identifiers: PAT-CL-195-47, Gluconobacter suboxydans, L(+)-tartaric acid.

The patent describes the production of L(+)-tartaric acid by the use of Gluconobacter suboxydans on a medium containing more than 0.1 mg. l. of pantothenic acid.

PATENT-3 616 250 Not available NTIS
Department of Agriculture, Washington, D.C.
PREFERENTIAL ENZYMATIC LYSIS OF VEGETATIVE CELLS IN PRESENCE OF SPORULATED BACTERIAL CELLS.
Patent, *Filed 22 Oct 68, patented 26 Oct 71, George R. Hrubant, and Robert A. Rhodes. 26 Oct 71, 3p PAT-APPL-769 701,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Bacillus, Bacteria, Spores, Extraction.
Identifiers: *Bacillus popilliae, *Lysis, PAT-CL-195-96.

The invention relates to the discovery of an enzymatic means for selectively lysing vegetative bacterial cells but not the corresponding spores, thus permitting isolation and study of the latter, if desired.

PATENT-3 617 447 Not available NTIS
Department of Agriculture, Washington, D.C.
PRODUCTION OF MEVALONIC ACID BY ENDOMYCOPSIS FIBULIGER.
Patent, *Filed 9 Jan 69, patented 2 Nov 71, Kei Arima, and Gakuzo Tamura. 2 Nov 71, 2p PAT-APPL-790 162,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Fermentation, *Yeasts, Biosynthesis, Carboxylic acids, Hydroxy acids, Aerobic processes.
Identifiers: PAT-CL-195-37, Endomycopsis fibuliger, *Valeric acid/3-5-dihydroxy-3-methyl.

The patent describes the production of about 1,000 micrograms of mevalonic acid per milliliter of fermented medium by the four- to 5-day fermentations of the unrestrictedly available yeast Endomycopsis fibuliger NRRL Y-7069.

PB-232 826/8GA PC$3.00/MF$1.45
Medical Coll. of Pennsylvania, Philadelphia.
PREPARATION OF ANTI-INTERFERON SERUM; PRODUCTION OF CRUDE AND PARTIALLY PURIFIED MOUSE INTERFERON.
Annual rept. 1 Jun 73-31 May 74,
Kurt Paucker, Clifton A. Ogburn, and Kurt Berg. 20 Feb 74, 16p IDB-VDP-02-089
Contract N01-AI-0-2126

Descriptors: *Antiviral agents, *Immune serums, Preparation, Antibodies, Humans, Mice, Leukocytes, Tissue culture, Immunity, Immunology, Rabbits, Research.
Identifiers: *Interferon.

Immunizations of groups of rabbits with human interferons prepared in peripheral leukocytes and foreskin fibroblasts were continued according to schedule. Some animals injected with leukocyte interferon have developed high levels of neutralizing antibodies, and bleedings are obtained at regular intervals. A serum pool of 200 ml is currently being subjected to various immunoabsorption steps and will be released for distribution in the near future.

PB-232 848/2GA PC$3.25/MF$1.45
Flow Labs., Inc., Rockville, Md.
RESEARCH AND DEVELOPMENT IN SUPPORT OF THE LABORATORY OF INFECTIOUS DISEASES (LID), NIAID RESPIRATORY VIRUS AND MYCOPLASMA RESEARCH PROGRAM. (PART A). TISSUE CULTURE PRODUCTIONS AND DEVELOPMENT LABORATORIES. (PART B).
Annual rept. 1 Mar 73-1 Mar 74,
L. Potash, and J. Haughom. 15 Mar 74, 46p IDB-VDP-03-091
Contract NO1-AI-32521

Descriptors: *Respiratory diseases, *Viral diseases, *Parainfluenza viruses, *Vaccines, Mutations, Viruses, Attenuation, Development, Immunity, Immunology, Myxoviruses, Research.
Identifiers: *Respiratory syncytial virus.

The objectives are to perform studies which support efforts to develop attenuated mutants of myxoviruses and paramyxoviruses of importance in human respiratory tract disease. These studies consist specifically of searching for double mutants of respiratory syncytial virus (RS) following the remutagenizing of the RS TS-1 mutant, and attempting to isolate ts mutants of parainfluenza virus types 1, 2 and 3. At the direction of the Project Officer, those mutants shich in in vitro and in vivo systems appear promising are to be evaluated in volunteers. A five-liter pool of London 1972 influenza A (H3N2) - ts 1 'E' vaccine in embryonated eggs is to be safety tested. Research and development studies are to be performed on the inactivation and stabilization studies on parainfluenza viruses for potential use as vaccines.

PB-232 849/0GA PC$5.25/MF$1.45
Institute for Cancer Research, Philadelphia, Pa.
RADIOIMMUNOASSAY FOR AUSTRALIA ANTIGEN (HAA).
Final rept. 1970-73,
Irving Millman, and Baruch S. Blumberg. 29 Aug 73, 41p
Contract PHS-70-2234
See also PB-211 831.

Descriptors: *Hepatitis viruses, *Antigens, Blood donors, Assaying, Serology, Purification, Blood serum, Blood transfusion, Antibodies, Tables(Data), Immunology.
Identifiers: *Australia antigen, *Radioimmunoassay.

The report presents evidence that the radioimmunoassay (RIP) method is capable of detecting donor groups which are positive for Australia antigen and antibody. Evidence is presented that high concentrations of antibody may indicate antigen-antibody complexes. Data presented show that unless certain conditions are met false negative results could occur by radioimmunoassay. The authors have presented data that mosquitoes and clams may harbor Australia antigen. Antibody to Australia antigen has been found to be associated with antibodies to gamma globulin and Australia antigen to be associated with primary biliary cirrhosis. Experiments to determine the presence of reverse transcriptase in Australia antigen are described. Several experiments designed to: determine the effect of transfusion of sera containing antibody to Australia antigen, evaluate the RIP for subtyping and study the conditions which produce unreliable results with solid phase assay systems are being curtailed due to our failure to obtain continued financial support.

6O. Pharmacology

AD-780 618/5GA Reprint
Edgewood Arsenal Aberdeen Proving Ground Md
THE ALTERATION OF ADVERSIVE THRESHOLDS WITH CHOLINERGIC AND ADRENERGIC AGENTS.
Special publication Feb 70-Oct 72,
Vincent P. Houser, and Frances L. Houser. 30 Mar 73, 16p Rept no. EB-SP-74008
Availability: Pub. in Pharmacology Biochemistry and Behavior, v1 p433-444 1973.

Descriptors: *Thresholds(Physiology), *Sympathomimetic agents, *Parasympathomimetic agents, Autonomic agents, Drugs, Response(Biology), Tolerances(Physiology), Behavior, Senses(Physiology), Monkeys, Experimental data, Stimuli, Shock.
Identifiers: *Avoidance responses.

Several cholinergic and adrenergic agents were administered to five squirrel monkeys in a titration schedule to ascertain their effects upon aversive thresholds. A narcotic analgesic, morphine sulfate, in several doses was able to reliably increase the aversive threshold. Scopolamine hydrobromide and d-amphetamine sulfate elevated the aversive threshold upon initial administration, but this effect was lost after the animals had experienced several drug sessions. Thus, animals demonstrated pronounced drug tolerance in response to these two agents. Amphetamine also produced increased general motor activity and stereotyped behaviors. Furthermore, amphetamine produced a response profile which strongly suggested that animals were responding without regard to the shock intensity presented. Pilocarpine nitrate and scopolamine methylbromide had no reliable effects upon behavior given alone or in conjunction with each other. Alpha-methyl-p-tyrosine in several doses reliably increased the aversive threshold and reduced reponse rates in all animals tested. These results suggested that adrenergic mechanisms may be involved in mediating the aversive qualities of electric shock. (Modified author abstract)

AD-780 654/0GA Not available NTIS
Flying Personnel Research Committee London (England)
BEHAVIOURAL AND NEUROLOGICAL DISTURBANCES ASSOCIATED WITH HYPOXIC BRAIN DAMAGE,
Avril E. Blagbrough, J. B. Brierley, and A. N. Nicholson. 25 Oct 72, 17p Rept no. FPRC-1323
Availability: Pub. in Jnl. of the Neurological Sciences, v18 p475-488 1973.

Descriptors: *Hypoxia, *Mental disorders, *Neurology, Aviation medicine, Barometric pressure, Great Britain, Lesions, Monkeys, Behavior, Stress(Physiology).
Identifiers: Macaca mulatta, *Brain damage.

Twenty-one monkeys (Macaca mulatta), trained on tasks of object alternation, spatial alternation and visual discrimination, were exposed in air to a steady ambient pressure of 160 mm Hg(equivalent to an altitude of 37,500 ft with a calculated inspired oxygen tension of 24 mmHg). Ten animals which sustained hypoxic-ischaemic brain damage exhibited behavioural and neurological impairments. Observations on the nature and time course of impairment after hypoxia suggest that: behavioural and neurological disturbances are dependent upon damage in specific regions of the brain; although primary brain damage is essential, factors other than neuronal loss contribute to the impairment; and recovery of function in animals with restricted lesions proceeds in the presence of permanent brain damage.

AD-781 017/9GA Not available NTIS
National Research Council of Canada Halifax (Nova Scotia) Atlantic Regional Lab
DIARYLPROPANOIDS FROM NUTMEG AND MACE ('MYRISTICA FRAGRANS HOUTT'),
Janet E. Forrest, Ronald A. Heacock, and Thomas P. Forrest. 29 Jun 73, 7p
Prepared in cooperation with Dalhousie Univ., Halifax (Nova Scotia). Dept. of Chemistry.
Availability: Pub. in Jnl. of the Chemical Society, Perkin Transactions I, p205-209 1974.

Descriptors: *Aromatic compounds, *Psychotropic agents, Dimers, Ethers, Chemical structure, Molecular structure, Infrared spectra, Nuclear magnetic resonance, Mass spectra, Drugs, Plants(Botany), Canada.
Identifiers: Myristica fragans, *Mace, *Nutmeg, Seasonings, *Aryl ethers.

Some diarylpropanoid (bis-C6-C3) type compounds have been isolated during the course of a search for the psychoactive components present in the seed (nutmeg) and aril (mace) of the fruit of Myristica fragrans Houtt. The presence of two different structural types, analogous to the beta-ortho-4 ether and 2,3-dihydrobenzofuran types of dilignols, has been established. Six examples (I)-(III) and (V)-(VIII) of the former type and two of the latter, dehydrodi-isoeugenol (IX) and 5-methoxydehydrodi-isoeugenol (X) have been isolated and their structures established. Compounds (I), (II), and (V), have been synthesised and the relative configuration of the beta-ortho-4 ethers has been established as erythro. (Author)

AD-781 059/1GA Not available NTIS
National Research Council of Canada Halifax (Nova Scotia) Atlantic Regional Lab
A CHROMATOGRAPHIC COMPARISON OF THE CONSTITUENTS OF NUTMEG AND MACE ('MYRISTICA FRAGRANS HOUTT') WITH THOSE OF MARIHUANA AND HASHISH ('CANNABIS SATIVA L.')
Janet E. Forrest, and R. A. Heacock. 19 Oct 73, 6p NRC-13697
Availability: Pub. in Jnl. of Chromatography, v89 p113-117 1974.

Descriptors: *Cannabis, Chromatographic analysis, Drugs, Narcotics, Plants(Botany), Canada.
Identifiers: *Myristica fragrans, *Nutmeg, *Mace, Seasonings, Marijuana.

In all the solvent systems utilized, the cannabinoids can readily be distinguished from the nutmeg and mace phenolics, which cannot be demonstrated by the preliminary field test. The cannabidiol, cannabinol and tetrahydrocannabinol have high RF values in the systems used, whilst the cannabinoids having an acid function in the molecule tend to migrate more slowly. These studies have shown that with the chromatographic systems used for the Fast Blue salt B (FBB) positive substances extractable from nutmeg and mace with cold light petroleum tend to be in the lower half of the chromatogram in the cannabinoid acid region.

JPRS-62171 PC$3.00/MF$1.45
Joint Publications Research Service, Arlington, Va.
ANTIDOTES AND THEIR MECHANISMS OF ACTION IN THE ORGANISM,
G. I. Oksengendler. 5 Jun 74, 16p
Trans. of Priroda (USSR) n4 p50-59 1973.

Descriptors: *Antidotes, Pharmacology, Drug therapy, Toxic diseases, Toxicology, USSR, Translations.

Since current concepts are that the majority of toxins disrupt the function of enzymatic systems in the organism, the development of many modern antidotes is closely associated with understanding the molecular mechanisms of these disruptions. The toxicology of several poisons, medicinal preparations, industrial poisons and other biologically active chemical compounds is clarified. Antidotes, whose mechanisms of action are being studied, can be divided into a number of groups dif-

fering in their molecular interrelations in the organism. The application of antidotes can be effective only when the poison does not cause severe denaturation of protein structures and when the pathological alterations elicited by the poison are reversible.

PAT-APPL-418 156 PC$4.50/MF$1.45
Department of Health, Education, and Welfare, Bethesda, Md. Patent Branch.
PREPARATION OF A CHEMICALLY STABLE CHOLERA TOXOID.
Patent Application,
R. Rappaport. Filed 21 Nov 73, 30p DHEW-K-87-73
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Toxins and antitoxins, *Patent applications, *Cholera, Precipitation(Chemistry), Preparation.

A chemically stable cholera toxoid is prepared by reacting cholera toxin with excess glutaraldehyde in an inert aqueous medium at a pH ranging from about 6 to about 9. The toxoid may be adsorbed on an aluminum phosphate gel in the presence of protamine.

PATENT-3 332 847 Not available NTIS
Department of Agriculture, Washington, D.C.
ALMARCETIN AND ITS PRODUCTION BY STREPTOMYCES ALBUS.
Patent, *Filed 8 Dec 64, patented 25 Jul 67,
Marilyn J. Bachler, Lloyd A. Lindenfelser, and Odette L. Shotwell. 25 Jul 67, 4p PAT-APPL-416 942,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Antibiotics, *Patents, Streptomyces, Antiinfectives and antibacterials, Bacteria, Fermentation.
Identifiers: *Streptomyces albus, *Almarcetin, PAT-CL-167-65.

The invention relates to a novel antimicrobial agent that is active in vitro against a broad spectrum of gram-negative bacteria as well as to some gram-positive bacteria, acid-fast bacteria, yeasts, and molds. Almarcetin is a dialyzable multi-factor acidic polypeptide complex having an absorption maximum at 300 millimicrons in water, which is present in the culture broth from fermentations of a particular strain of a subspecies of Streptomyces albus, viz. NRRL B-3141.

PATENT-3 666 630 Not available NTIS
Department of Agriculture, Washington, D.C.
PRODUCTION OF TREMORTINS A, B, AND C.
Patent, *Filed 4 May 70, patented 30 May 72,
[illegible]v Ceigler, and Ching Tsang Hou. 30 May 72, 4p PAT-APPL-34 390,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Rodenticides, *Toxins and antitoxins, *Rodent control, Penicillium, Fungi, Pest control, Central nervous system, Convulsive disorders, Pharmacology.
Identifiers: *Biological pest control, PAT-CL-195-81.

The invention relates to the production of a group of tremorgenic toxins (tremortins A, B, and C), and has for its prime object the provision of processes for production and isolation of these said tremorgens. Further objects of the invention will be evident from the following description wherein parts and percentages are by weight unless otherwise specified. Tremorgens are compounds which have the ability of eliciting a sustained trembling, convulsions, and eventually death in various rodents. Because of this ability, the tremortins may be employed as rodenticides for the control of various and select rodents such as mice and rats.

PATENT-3 793 454 Not available NTIS
Department of Agriculture, Washington, D.C.
HARRINGTONINE AND ISOPHARRINGTONINE FOR TREATING L1210 OF P388 LEUKEMIC TUMORS IN MICE.
Patent, *Filed 12 Nov 71, patented 19 Feb 74,
Richard G. Powell, and Cecil R. Smith Jr. 19 Feb 74, 8p PAT-APPL-198 443,
Previously filed as PAT-APPL-26 995, 9 Apr 70.
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Antineoplastic agents, *Leukemias, *Patents, Drugs, Neoplasms, Plants(Botany), Extraction, Alkaloids, Mice, Experimental data.
Identifiers: *Cephalotaxus harringtonia, PAT-CL-424-274.

Alkaloids found to be chemotherapeutically active against leukemic strains L1210 and P388 in mice are produced from Cephalotaxus harringtonia. The process includes extraction of plant parts with a polar solvent, partitioning the plant extracts between nonpolar and acidic aqueous solvents, making the aqueous portion basic, and removing the crude alkaloids from the basic aqueous solution. The crude alkaloids are purified and used in the treatment of mice implanted with leukemic strains L1210 and P388.

PB-232 806/0GA PC$3.25/MF$1.45
New York Univ. Medical Center, N.Y.
THE EVALUATION OF SYSTEMIC AND TOPICALLY ADMINISTERED ANTIVIRAL COMPOUNDS ON THE PREVENTION AND TREATMENT OF EXPERIMENTALLY VIRUS-INDUCED SKIN INFECTIONS IN ANIMAL MODELS.
Annual progress rept. 26 Feb 73-18 February 74,
Alvin E. Friedman-Kien, and Richard J. Klein. 18 Feb 74, 45p IDB-ASP-02-059
Contract N01-AI-0-2131

Descriptors: *Antiviral agents, *Viral diseases, *Skin diseases, Vaccinia virus, Herpes simplex virus, Experimental data, Rabbits, Mice, Laboratory animals, Evaluation, Therapy, Prophylaxis.
Identifiers: Shope fibroma virus, Adenine/arabinosyl, Idoxuridine.

A wide variety of antiviral agents of antiviral compounds have been evaluated in three experimental model viral infections in animal skin: The Shope fibroma virus (SFV) infection in rabbit skin; the vaccinia virus (VV) infection in rabbit skin; and the herpes simplex virus (HSV) infection in skin of hairless mice. Among the antiviral agents tested 9-beta-D-arabinofuranosyladenine (ara-A) proved to be nontoxic in therapeutic doses and was able to suppress and/or cure skin infections induced by SFV, VV, and HSV. The HSV infection in hairless mice benefited also from treatment with 5-iodo-2'-deoxyuridine (IUdR). Other compounds proved to be either ineffective, or like 6-aza-uridine exhibited an enhancing effect upon the evolution of the infection.

PB-232 856-T/GA PC$4.00/MF$1.45
National Institutes of Health, Behtesda, Md. Translation Unit.
EFFECTS OF LARGE DOSES OF ANTIBLASTIC SUBSTANCES ON A TUMOR OF AN EXTREMITY,
Yu. L. Guchek. 7 Jun 74, 6p NIH-74-270
Trans. of Vrachebnoe Delo (USSR) v7 p77-78 1966.

Descriptors: *Antineoplastic agents, *Malignant neoplasms, *Drugs, *Toxicology, Experimental data, Pharmacology, Drug therapy, Rabbits, USSR, Translations, Dosage, Bioassay.
Identifiers: Thio TEPA, Brown-Pearce carcinoma, Oxazaphosphorine/bis/((chloroethyl)amino) - tetrohydro - oxide.

Experiments conducted on 69 rabbits indicate that the regional perfusion method of drug administration allows for large doses of antineoplastic agents at primary cancer sites. Infusions of 10% glucose or whole blood proved efficient in preventing leakage of the antineoplastic agent into the general circulation. Thio-TEPA proved more efficient than cyclophosphane during perfusion treatment on rabbit Brown-Pearce carcinoma.

PB-232 857-T/GA PC$4.00/MF$1.45
National Institutes of Health, Bethesda, Md. Translation Unit.
KINETICS OF THIOPHOSPHAMIDE IN THE BLOOD OF MAMMARY-CANCER PATIENTS,
V. A. Filov, and Ya. L. Bavli. 31 May 74, 8p NIH-74-428
Trans. of Voprosy Onkologii (USSR) v20 n1 p11-15 1974.

Descriptors: *Antineoplastic agents, *Breast neoplasms, Blood, Metaholism, Microanalysis, Drug therapy, USSR, Translations.
Identifiers: Phosphine sulfide/tris(1-aziridinyl).

The level of thiophosphamide remaining in the blood was variable after one minute in cancer patients injected with the drug. There was a prompt reduction in the concentration level after ten minutes and complete elimination after 20-30 minutes. No correlation could be made between the variability of the half-life of thiophosphamide and its concentration one minute after administration with the clinical characteristics of the patients.

6P. Physiology

AD-780 827/2GA PC$3.25/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
THE ELECTROENCEPHALOGRAM OF THE HEALTHY PERSON. CHAPTER III,
V. S. Rusinov. 4 Jun 74, 44p Rept no. FTD-HC-23-2040-74
Edited trans. of mono. Klinicheskaya Elektroentsefalografiya, n.p., 1973 p49-72.

Descriptors: *Electroencephalography, Normality, Humans, Bioelectricity, Brain, Electrophysiology, Sleep, USSR, Translations.

The most characteristic feature of the human EEG, which distinguishes it from the EEG of animals, is the regular rhythmic activity, called the alpha rhythm, having a frequency of 8-12 oscillations per second, an amplitude of 50-100 microvolts and clearer manifestation in taps from the posterior sections of the hemispheres. The dominance of the alpha rhythm in the pattern of bioelectrical activity is typical for the brain of the healthy human adult in a state of relative rest. The rhythm of the biopotentials of the brain in infants is almost completely absent. The EEG evolves with age and as the nerve elements mature, the oscillation frequency gradually increases, a more or less stable rhythm develops and an EEG pattern, typical for the adult human, is established by 14 to 16 years of age.

AD-780 833/0GA PC$3.25/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
ELECTROENCEPHALOGRAMS OF CHILDREN WITH NORMAL AND PATHOLOGICAL CONDITIONS,
N. S. Galkina. 7 Jun 74, 29p Rept no. FTD-HC-23-2043-74
Edited trans. of mono. Klinicheskaya Elektroentsefalografiya, n.p., 1973 p270-285.

Descriptors: *Electroencephalography, Children, Bioelectricity, Brain, Electrophysiology, Normality, Pathology, USSR, Translations.

The typical feature of the EEG of a healthy child aged up to 7 years is the existence of slow forms of

electrical activity (delta- and teta-waves). It is not until the age of 7-8 years that there appears on the EEG of a child a regular alpha-rhythm, which is somewhat reduced in frequency (7-9 oscillations a second). However, in addition to the alpha-rhythm there are also retained the delta-waves, which are especially steadily expressed in the anterior sections of the hemispheres. These peculiarities of a child's EEG attest to the lower level of functional mobility of the child's coritcal cells as compared with adult ones and must be taken into consideration when interpreting the EEG of children with Focal damage of the brain. On the basis of numerous studies it can be concluded that in children with a tumor of the brain, unlike adults, there are cruder general-cerebral changes in the electrical activity.

AD-781 110/2GA PC$3.00/MF$1.45
Royal Aircraft Establishment Farnborough (England)
THE EFFECT OF ADAPTATION TO COLD ON THE ENERGY OF MUSCULAR ACTIVITY (VLIYANIE ADAPTATSII K KHOLODU NA ENERGETIKU MYSHECHNOI DEYATELNOSTI),
Yu. I. Bazhenov. Apr 74, 9p Rept no. RAE-Library Trans-1749 DRIC-BR-41242
Trans. of Akademiya Nauk SSSR. Doklady, v208 n5 p1250-1252 1973, by J. W. T. Palmer.

Descriptors: *Adaptation(Physiology), *Muscles, Electromyography, Metabolism, Physiology, Low temperature, Heat production(Biology), Rats, Experimental data, USSR, Translations.
Identifiers: *Cold adaptation.

The paper verifies the facts about the reduction of the efficiency of muscular activity as a result of adaptation to cold by comparing the metabolism and contractive activities of muscles, their electrical activity being a reflection of this.

N74-21714/2GA PC$4.50/MF$1.45
Technion - Israel Inst. of Tech., Haifa. Dept. of Aeronautical Engineering.
ENERGETIC ADVANTAGES OF BURST SWIMMING OF FISH.
D. Weihs. Dec 73, 28p TAE-189

Descriptors: *Energy consumption, *Fishes, *Swimming, Bioengineering, Gliding, Muscular function.

For abstract, see STAR 1213

N74-21737/3GA PC$4.00/MF$1.45
Scientific Translation Service, Santa Barbara, Calif.
FLIGHT DICTATES TRAINING.
R. Makarov. Apr 74, 10p NASA-TT-F-15504
Contract NASW-2483
Tran-Transl. Into English from Aviat. Kosmonavt. (Ussr), No. 2, 1974 p 44-45.

Descriptors: *Astronaut training, *Exercise (Physiology), *Pilot training, Equipment specifications, Physical fitness, Psychophysiology, Space flight training, Training devices.

For abstract, see STAR 1213

ORO-4056-4 PC$4.00/MF$1.45
Baylor Univ., Dallas, Tex. (Usa). Coll. Of Dentistry.
PROGRESS REPORT ON INTRACELLULAR TRANSPORT OF IONS IN MINERALIZING TISSUES, JULY 1, 1972--MARCH 20, 1974.
1974, 5p
Contract AT(40-1)-4056

Descriptors: Bone seekers, Bone tissues, Electron microscopy, Extracellular space, Fluid flow, Ion detection, Labelling, Mineralization, Myoglobin, Peroxides, Phosphates, Phosphorus 33, Tibia, Translocation.

For abstract, see NSA 30 01, number 02300.

6Q. Protective Equipment

AD-780 665/6GA PC$3.75/MF$1.45
Navy Experimental Diving Unit Washington D C
COMPARATIVE EVALUATION OF SWIM FINS,
W. G. Fischer. 1 Mar 57, 55p Rept no. NEDU-Evaluation-18-57

Descriptors: *Swimming, *Naval equipment, Reliability, Footwear, Acceptability.
Identifiers: *Swim fins.

Fourteen commercially available types of swim fins were evaluated for efficiency and comfort with the aim of determining which were the most suitable for Naval use and of learning what factors in design favor these characteristics. Efficiency was studied by measurement of oxygen consumption in stationary swimming against a constant force in 15-minute runs. The differences found efficiency were large enough to have distinct operational importance. (Modified author abstract)

6R. Radiobiology

BNWL-SA-4566 PC$4.00/MF$1.45
Battelle Pacific Northwest Labs., Richland, Wash. (Usa).
SOLUBILITY CHANGES OF EXP 238 PU OXIDE IN WATER SUSPENSION AND EFFECT ON BIOLOGICAL BEHAVIOR AFTER INHALATION BY BEAGLE DOGS.
J. F. Park, D. L. Catt, D. K. Craig, R. J. Olson, and V. H. Smith. 1973, 6p CONF-730907-25
Contract AT(45-1)-1830

Descriptors: (*Plutonium 238, *Tissue distribution), (*Plutonium 239, Tissue distribution), (*Plutonium oxides, *Inhalation), (*Lungs, *Radionuclide kinetics), Aqueous solutions, Beagles, Comparative evaluations, Liver, Lymph nodes, Skeleton, Solubility, Time dependence, Uptake.

For abstract, see NSA 30 01, number 00697.

CEA-CONF-2545 PC$3.25/MF$1.45
Cea Centre d'Etudes Nucleaires de Fontenay-aux-Roses, 92 (France). Dept. De Protection.
PROTECTION PROBLEMS CAUSED BY NONIONIZING RADIATION.
H. Jammet. 1973, 25p CONF-730907-22
In French.

Descriptors: (*Radiation protection, *Regulations), (*Personnel, *Radiation hazards), Human populations, Infrared radiation, Lasers, Microwave radiation, Monitoring, Pathology, Radiation sources, Solar radiation, Ultraviolet radiation.

For abstract, see NSA 30 01, number 02292.

COO-3017-13 PC$4.25/MF$1.45
New England Deaconess Hospital, Boston, Mass. (Usa). Cancer Research Inst.
RADIATION CARCINOGENESIS. PROGRESS REPORT I, 1 MAY 1972--15 MARCH 1974.
S. Warren, and O. Gates. 1974, 22p
Contract AT(11-1)-3017

Descriptors: (*Parabiosis, *Radiosensitivity effects), (*Neoplasms, *Radioinduction), Aging, Biological radiation effects, Carcinogenesis, Ionizing radiations, Kidneys, Lethal irradiation, Mammary glands, Mice, Mutations, Radiation injuries, Rats, Survival time.

For abstract, see NSA 30 01, number 00569.

LF-46 PC$10.60/MF$1.45
Lovelace Foundation for Medical Education and Research, Albuquerque, N.Mex. (Usa).
ANNUAL REPORT OF THE INHALATION TOXICOLOGY RESEARCH INSTITUTE, OCTOBER 1, 1972--SEPTEMBER 30, 1973.
R. O. McClellan, and F. C. Rupprecht. Dec 73, 350p
Contract AT(29-2)-1013

Descriptors: (*Radioactive aerosols, *Inhalation), Beagles, Leading abstract, Mammals, Toxicity.

For abstract, see NSA 30 01, number 00698.

N74-21720/9GA PC$5.75/MF$1.45
Atomic Energy of Canada Ltd., Chalk River (Ontario).
BIOLOGY AND HEALTH PHYSICS DIVISION.
Progress Report, 1 Apr. - 30 Jun. 1973.
Aug 73, 71p AECL-4610

Descriptors: *Biology, *Health physics, *Populations, Environments, Nuclear physics, Nuclear research.

For abstract, see STAR 1213

ORO-3630-19 PC$4.00/MF$1.45
Texas Univ., Dallas (Usa). Inst. For Molecular Biology.
PHOTOREPAIR OF UV DAMAGE TO DNA: PURIFICATION AND PROPERTIES OF THE DNA PHOTOLYASE (THE DNA-PHOTOREACTIVATING ENZYME). PROGRESS REPORT, AUGUST 1, 1973--JULY 31, 1974.
H. Werbin. 1974, 9p
Contract AT(40-1)-3630

Descriptors: (*Dna, *Photoreactivation), (*Enzymes, *Biochemical reaction kinetics), (*Yeasts, *Biological radiation effects), Biological repair, Radiation injuries, Ultraviolet radiation.

For abstract, see NSA 30 01, number 00457.

SU-326-P-32-X-4 PC$5.50/MF$1.45
Stanford Univ., Calif. (Usa). Dept. Of Pathology.
STUDIES ON THE REPAIR OF DAMAGED DNA IN BACTERIOPHAGE, BACTERIAL, AND MAMMALIAN SYSTEMS. PROGRESS REPORT.
15 Mar 74, 46p
Contract AT(04-3)-326

Descriptors: (*Dna, *Biological repair), (*Bacteriophages, *Biological radiation effects), (*Bacteria, Biological radiation effects), (*Nucleases, Biological radiation effects), Animal cells, Biochemistry, Cell cultures, Genes, Mitochondria, Photon beams, Pyrimidines, Ultraviolet radiation.

For abstract, see NSA 30 01, number 00486.

TID-26554 PC$4.00/MF$1.45
Puerto Rico Nuclear Center, Mayaguez.
SPECIAL BREEDING AND EVALUATION TECHNIQUES FOR SOYBEAN IMPROVEMENT.
F. K. S. Koo. 1973, 19p
Contract AT(40-1)-1833

Descriptors: (*Glycine hispida, *Genetic radiation effects), (*Mutations, *Radioinduction), Ems, Genetic effects, Imines, Ionizing radiations, Irradiation, Mutagens, Plant breeding, Tropical regions.

For abstract, see NSA 30 01, number 00512.

UCD-472-119 PC$7.60/MF$1.45
California Univ., Davis (Usa). Radiobiology Lab.
ANNUAL REPORT, FISCAL YEAR 1972.
Jun 72, 151p
Contract AT(04-3)-472

Descriptors: (*Beagles, *Biological radiation effects), Anatomy, External irradiation, Internal irradiation, Leading abstract, Physiology, Radionuclide administration, Research programs.

For abstract, see NSA 30 01, number 00670.

UR-3490-457 PC$4.50/MF$1.45
Rochester Univ., N.Y. (Usa).
EVALUATION OF THE INTERNATIONAL SYMPOSIUM ON BIOLOGIC EFFECTS AND HEALTH HAZARDS OF MICROWAVE RADIATION, WARSAW, POLAND, OCTOBER 15--18, 1973.
S. M. Michaelson. 1973, 27p CONF-740220-1

Descriptors: (*Microwave radiation, *Biological effects), (*Microwave equipment, *Health hazards), Communications, Human populations, Measuring methods, Recommendations, Standardized terminology.

For abstract, see NSA 30 01, number 02308.

6S. Stress Physiology

AD-780 606/0GA PC$3.25/MF$1.45
Advisory Group for Aerospace Research and Development Paris (France)
HELICOPTER AIRCREW FATIGUE.
Advisory rept.,
I. C. Perry. May 74, 26p Rept no. AGARD-AR-69
NATO furnished.

Descriptors: *Fatigue(Physiology), *Flight crews, Aviation personnel, Performance(Human), Stress(Physiology), Helicopters, Aviation accidents, Diagnosis(Medicine), France.
Identifiers: Recommendations.

The studies by the Group have shown that aviator fatigue is generally agreed to be an important problem in helicopter operation. Apart from the effects that such a condition has on efficiency, fatigue has also been found to be an important contributory factor in helicopter accidents, both in peace time operations and in the combat environment. Many of the major causes of fatigue result from inadequate training on the part of those responsible for the well-being of aircrew; such training in the causes and effects of fatigue would of themselves lead to the changes of organization and procedures which would minimise the occurrence of fatigue. It has been found that the Army helicopter aviator throughout the NATO Nations, continues to be treated and to work under the same conditions as the ground soldier. Whilst such a policy may have been desirable in the past, it can now be argued that because of the increasing complexity and expense of the aircraft used, the aviator should be considered as more of an integral part of the man-machine complex rather than as a ground soldier. He should therefore be managed and maintained more like the aircrew of the Air Forces and Navies of NATO.

AD-780 655/7GA Not available NTIS
Flying Personnel Research Committee London (England)
INFLUENCE OF WORKLOAD ON THE NEUROLOGICAL STATE OF A PILOT DURING THE APPROACH AND LANDING,
A. N. Nicholson, L. E. Hill, R. G. Borland, and W. J. Krzanowski. 1973, 10p Rept no. FPRC-Memo-254
Availability: Pub. in Aerospace Medicine, v44 n2 p146-152 Feb 73.

Descriptors: *Neurology, *Stress(Physiology), *Pilots, Aviation personnel, Job analysis, Great Britain, Approach, Landing, Electrocardiography, Aviation medicine.

The present studies have emphasised the importance of workload patterns to the physiological changes which develop in a pilot during the approach and landing. The progressive elevation of neurological arousal in manual let downs, implicit in the shortening of the rr interval from top of descent, was modified by the technique of shared and coupled approaches, but gross finger tremor after landing, which is due to untoward events during the approach and around touch down, remained unaffected by the changes in flight deck workload patterns.

AD-780 847/0GA PC$5.75/MF$1.45
Army Aeromedical Research Lab Fort Rucker Ala
THE EFFECTS OF INITIAL SPINAL CONFIGURATION ON PILOT EJECTION,
Y. King Liu, Uwe R. Pontius, and Ronald R. Hosey. Oct 73, 56p Rept no. USAARL-74-6

Descriptors: *Spinal column, *Ejection seats, Impact, Wounds and injuries, Static conditions, Biomechanics, Stress(Physiology), Pilots, Aerospace medicine, Anthropometry.
Identifiers: Recommendations.

The effect of initial spinal alignment on the location and magnitude of maximum vertebral stress during ejection was studied using the Orne-Liu discrete parameter model of the spine. Face curtain, shoulder harness, and seat back restraints were added to the model as linear springs. Spinal alignment data used were from x-rays of a 5th, 40th, and 95th percentile (sitting height) man seated in the MK-J5(D) ejection seat under static conditions. Maximum normal stresses were shown to occur at L1(5th), T12(40th) and T9(95th) with face curtain and shoulder harness restraint. Results indicated that a state of nearly uniform axial stress exists in the column during ejection and thus the location of maximum bending stress dictates the spinal location of the maximum normal stress. Hence, initial spinal alignment, in terms of the curvature of the column, is a major determinant of the location and magnitude of maximum normal stress for a given set of restraints. (Modified author abstract)

AD-780 977/5GA Reprint
Navy Medical Neuropsychiatric Research Unit San Diego Calif
EFFECTS OF N2O ON PERSONALITY RESPONSES IN DIVERS,
Robert J. Biersner, Darrel Edwards, and L. W. Bailey. 1 Mar 74, 9p Rept no. NMNRU-73-57
Availability: Pub. in Perceptual and Motor Skills, v38 p1091-1097 1974.

Descriptors: *Narcosis, *Personality, *Diving, *Hyperbaric conditions, Nitrogen, Central nervous system, Performance(Human), Physiological effects, Psychophysiology, Stress(Physiology).
Identifiers: *Nitrogen narcosis.

Thirty Navy divers were studied in a repeated measures design to determine the personality effects of breathing N2O, simulating air at approximately 210 feet on air. The hand test was used to measure personality changes. The number of interpersonal responses made on N2O was initially high and stable. Concern about the environment decreased on N2O. The major finding of loss of environmental attention was discussed in relationship to the procedures necessary to diving safety. Comparisons with other kinds of substance related experiences were also discussed. (Author)

AD-781 047/6GA Reprint
Naval Medical Research Inst Bethesda Md
ENDOGENOUS FORMATION OF CARBON MONOXIDE AND METHANE AT ELEVATED PRESSURE.
Medical research progress rept. no. 8,
F. Lee Rodkey, Merle E. Unstead, Rolf R. Engel, and Carl J. Rubenstein. 1974, 6p
Availability: Pub. in Aerospace Medicine, p397-399 Apr 74.

Descriptors: *Hyperbaric conditions, *Methane, *Carbon monoxide, *Diving, Stress(Physiology), Trace gases.
Identifiers: Helium oxygen atmospheres.

Five divers were confined in an oxygen-helium atmosphere in a simulated saturation dive to 600 ft for 6 d. Decompression was then accomplished over the next 7 d while maintaining the oxygen pressure within the chamber at 0.3 ATA. Samples of chamber gas and diver blood were obtained throughout the dive. Blood samples were analyzed for carboxyhemoglobin percent saturation and gas samples were analyzed for methane and carbon monoxide. Data obtained were used to calculate the rate of endogenous formation of methane and CO. Methane formation, due to intestinal bacteria, was about 16 ml/hour from the five subjects. CO formation, due to heme metabolism, was constant at an average value of 7.2 micromol/kg x d through the dive. (Modified author abstract)

AD-781 048/4GA Reprint
Naval Medical Research Inst Bethesda Md
STRUCTURAL ANALYSIS OF HYPERBARIC SPEECH UNDER THREE GASES.
Medical research progress rept. no. 2,
Georgia Maitland, and Arthur Findling. 1974, 9p
Availability: Pub. in Aerospace Medicine, v45 n4 p380-385 Apr 74.

Descriptors: *Hyperbaric conditions, *Speech, Gases, Neon, Helium, Nitrogen, Density, Acoustics, Audio frequency, Underwater sound.

The results of neon gas effects on speech at five different atmospheres, 1 atm, 13.1, 22.2, 28.3 and 37.4 ATA, are presented. These are compared with helium and nitrogen gas effects on speech at the same depths. Assuming a simple sound velocity for air, the sound velocity for each gas is computed and gives a good prediction for each speech frequency studied. The frequency shifts of neon are shown to be consistent with available data on the relationship of gas density to acoustic frequency for helium and nitrogen. (Author)

AD-781 092/2GA PC$5.50/MF$1.45
Kentucky Univ Lexington Wenner-Gren Research Lab
A STANDARD PSYCHOPHYSIOLOGICAL PREPARATION FOR EVALUATING THE EFFECTS OF ENVIRONMENTAL VIBRATION STRESS. PHASE II. IMPLEMENTATION,
E. P. McCutcheon, R. G. Edwards, J. M. Evans, J. F. Lafferty, and D. F. McCoy. Feb 74, 191p
AMRL-TR-73-118
Contract F33615-72-C-1112
See also AD-759 265.

Descriptors: *Vibration, *Psychophysiology, *Stress(Physiology), Performance(Human), Biomechanics, Primates.

A Standard Psychophysiological Preparation (SPP) for the evaluation of the physiological and biomechanical mechanisms responsible for performance decrement during repeated, long term exposure to vibration has been developed. The SPP is comprised of a trained Rhesus monkey, chronically implanted with probes to measure cardiovascular, hormonal and thermal parameters, with provisions for external measurements of the ECG, skin temperature, oxygen consumption, biomechanical parameters and performance level. Implementation of the SPP concept verifies the applicability and utility of the SPP and demonstrates the high quality, quantitative physiological and biomechanical data can be obtained with multiple systems from a performing subject during vibration exposure. Performance level, cardiovascular parameters, and biomechanical response of the SPP are presented as a function of vibration frequency and acceleration amplitude. (Author)

AD-781 167/2GA PC$4.00/MF$1.45
Army Foreign Science and Technology Center Charlottesville Va
PECULIARITIES OF PYRIDOXINE AND NICOTINIC ACID METABOLISM IN EXPERI-

MENTAL ANIMALS UNDER THE PHYSICAL STRESSES OF PROLONGED SWIMMING,
V. V. Efremov, and E. M. Zaburkin. 7 Nov 73, 11p
Rept no. FSTC-HT-23-417-73
Trans. of Voprosy Pitaniya (USSR) v31 n3 p39-43 May/Jun 72, by Smith.

Descriptors: *Swimming, *Stress(Physiology), *Pyridoxines, *Nicotinic acid, Metabolism, Coenzymes, Enzymes, Rats, Experimental data, USSR, Translations.

It has been established in experiments that the maximum physical stress (swimming until submergence) of white rats causes a significant reduction in elimination of 4-pyridoxinic acid and N1-methylnicotinamide with the daily urine, as well as a decrease in nicotinamide nucleotide coenzyme (NAD + NADP) content in the liver. Additional administration of increased quantities of pyridoxine and nicotinic acid in the ration increased the excretion of the metabolites studied and maintained the nicotinic acid coenzyme content in the liver at a high level. In animals, not receiving pyridoxine or nicotinic acid with the ration, a decrease in body weight and a reduction in the mean swimming time were observed. The results obtained provide a basis for proposing an increased requirement of the bodies of white rats for pyridoxine and nicotinic acid during the physical stresses of prolonged swimming.

CEA-N-1681 PC$6.00/MF$1.45
Cea Centre d'Etudes Nucleaires de Saclay, 91 - Gif-sur-Yvette (France).
DETERMINATION OF THE ADDITIONAL LOAD TO WHICH THE LUNGS OF AN INDIVIDUAL WEARING BREATHING EQUIPMENT ARE EXPOSED.
L. Chretien, Y. Le Bourdonnec, and B. Werderer. Dec 73, 58p
In French.

Descriptors: (*Lungs, *Biological stress), (*Personnel, *Working conditions), Breath, Respiration, Respirators, Ventilation.

For abstract, see NSA 30 01, number 00266.

N74-21700/1GA PC$4.00/MF$1.45
Techtran Corp., Glen Burnie, Md.
THE FUNCTION OF THERMOREGULATION IN PROTRACTED LIMITATION OF MOTOR ACTIVITY (HYPOKINESIA).
A. Y. Tizul. May 74, 9p NASA-TT-F-15566
Contract NASW-2485
Tran-Transl. Into English from Zh. Nevropatol. Psikhiatr. (Moscow), V. 73, No. 12, 1973 p 1791-1794.

Descriptors: *Human reactions, *Hypokinesia, *Long term effects, *Thermoregulation, Body temperature, Orthostatic tolerance, Physiological effects, Skin temperature (Biology).

For abstract, see STAR 1213

N74-21703/5GA PC$4.00/MF$1.45
Techtran Corp., Glen Burnie, Md.
MORPHOLOGICAL AND BIOCHEMICAL CHANGES IN RABBITS SUBJECTED TO CONSIDERABLE LIMITATION OF MOBILITY.
A. M. Vikhert, V. I. Metelitsa, V. D. Baranova, and I. Y. Galakhou. May 74, 9p NASA-TT-F-15427
Contract NASW-2485
Tran-Transl. Into English from Kardiologiya (Moscow), V. 12, Sep. 1972 p 143-146.

Descriptors: *Atrophy, *Cardiovascular system, *Immobilization, *Lipid metabolism, *Rabbits, Aorta, Biochemistry, Calcification, Hypodynamia, Myocardium, Pathological effects, Tissues (Biology).

For abstract, see STAR 1213

N74-21704/3GA PC$4.00/MF$1.45
Kanner (Leo) Associates, Redwood City, Calif.
CARDIAC DECONDITIONING DURING PROLONGED HYPODYNAMIA.
I. G. Krasnykh. Apr 74, 6p NASA-TT-F-15528
Contract NASW-2481
Tran-Transl. Into English from Voenno-Med. Zh. (Moscow), No. 2, Dec. 1973 p 54-56.

Descriptors: *Exercise (Physiology), *Heart minute volume, *Hypodynamia, *Tachycardia, Cardiovascular system, Dyspnea, Human tolerances, Physical fitness.

For abstract, see STAR 1213

N74-21705/0GA PC$4.00/MF$1.45
Kanner (Leo) Associates, Redwood City, Calif.
THE DANGERS OF STAYING IN BED (THE DELETERIOUS EFFECTS OF BED REST).
L. E. Boettriger. Apr 74, 6p NASA-TT-F-15561
Contract NASW-2481
Tran-Transl. Into English from Nord. Med. (Stockholm), V. 75, No. 7, 1966 p 188-189.

Descriptors: *Exercise (Physiology), *Human body, *Hypokinesia, *Pathological effects, Bed rest, Calcium metabolism, Clinical medicine, Hypertemion, Long term effects, Orthostatic tolerance.

For abstract, see STAR 1213

N74-21706/8GA PC$4.00/MF$1.45
Techtran Corp., Glen Burnie, Md.
A NEW METHOD OF EVALUATING RHEOENCEPHALOGRAMS AND ITS APPLICATION IN THE STUDY OF VERTIGO.
A. Y. Kurashvili, and O. Y. Plepis. Apr 74, 10p NASA-TT-F-15458
Contract NASW-2485
Tran-Transl. Into English from Ushnykh Nosovykh Gorlovykh Bolez (Ukrainian SSR), V. 32, Sep. - Oct. 1972 p 49-52.

Descriptors: *Computer techniques, *Data processing, *Fourier series, *Rheoencephalography, *Vertigo, Acceleration tolerance, Brain circulation, Coriolis effect, Human tolerances, Vestibular tests.

For abstract, see STAR 1213

N74-21709/2GA PC$4.00/MF$1.45
Techtran Corp., Glen Burnie, Md.
PARTICIPATION OF THYROID GLAND HORMONES IN THE MECHANISM OF DEVELOPMENT OF TROPHIC DISTURBANCES OF THE GASTRIC MUCOSA IN RATS RESULTING FROM THEIR PROLONGED IMMOBILIZATION.
P. P. Denisenko, and A. N. Poskalenko. May 74, 8p NASA-TT-F-15510
Contract NASW-2485
Tran-Transl. Into English from Patol. Fiziol. Eksp. Ter. (Ussr), V. 11, Jun. - Aug. 1967 p 30-32.

Descriptors: *Immobilization, *Rats, *Stomach, *Thyroid gland, *Thyroxine, Gastrointestinal system, Lesions.

For abstract, see STAR 1213

N74-21712/6GA PC$3.25/MF$1.45
National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
CIRCADIAN, ENDOCRINE, AND METABOLIC EFFECTS OF PROLONGED BEDREST: TWO 56-DAY BEDREST STUDIES.
J. Vernikos-danellis, C. M. Winget, C. S. Leach, and P. C. Rambaut. Apr 74, 47p NASA-TM-X-3051, A-5339

Descriptors: *Bed rest, *Human body, *Long term effects, *Rhythm (Biology), Aerospace medicine, Circadian rhythms, Endocrine systems, Metabolism.

For abstract, see STAR 1213

N74-21713/4GA PC$7.50/MF$1.45
National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
QUANTITATIVE VALUES OF BLOOD FLOW THROUGH THE HUMAN FOREARM, HAND, AND FINGER AS FUNCTIONS OF TEMPERATURE.
L. D. Montgomery. Mar 74, 88p NASA-TM-X-62342

Descriptors: *Arm (Anatomy), *Atmospheric temperature, *Blood flow, *Fingers, *Hand (Anatomy), *Temperature effects, Biological effects, Documentation, Medical science.

For abstract, see STAR 1213

N74-21716/7GA PC$4.00/MF$1.45
Techtran Corp., Glen Burnie, Md.
POSITIVE HABITUATION AND VESTIBULAR RECRUITMENT.
M. Emami-nouri. May 74, 12p NASA-TT-F-15509
Contract NASW-2485
Tran-Transl. Into English from Acta Oto-Laryngol. (West Ger.), V. 76, 1973 p 183-189.

Descriptors: *Adaptation, *Sensory stimulation, *Vestibular tests, Aerospace medicine, Coriolis effect, Ear pressure test, Rotating environments, Vertigo, Vision.

For abstract, see STAR 1213

N74-21717/5GA PC$5.50/MF$1.45
Scripta Technica, Inc., Washington, D.C.
STUDIES IN GEOMAGNETISM, AERONOMY AND SOLAR PHYSICS (PROBLEMS OF HELIOBIOLOGY AND THE BIOLOGICAL EFFECT OF MAGNETIC FIELDS) NO. 17.
A. T. Platonova. Jan 74, 198p NASA-TT-F-815
Contract NASW-2484
Tran-Transl. Into English of the Book "Issledovaniya Po Geomagnetizmu, Aeronomii I Fizike Solntsa (Voprosy Geliobiologii I Biologicheskogo Deystviya Magnitnykh Poley), Vypusk 17" Moscow, Nauka Press, 1971 p 1-174.

Descriptors: *Biological effects, *Magnetic fields, *Solar activity effects, *Statistical correlation, Cardiovascular system, Environment effects, Geomagnetism, Human body, Nervous system, Solar physics.

For abstract, see STAR 1213

N74-21739/9GA PC$4.00/MF$1.45
Techtran Corp., Glen Burnie, Md.
STUDY OF THE OPERATIVE REST STATE IN MAN.
K. S. Tochilov, V. M. Ukhin, and A. I. Shabanov. May 74, 12p NASA-TT-F-15564
Contract NASW-2485
Tran-Transl. Into English from Nerv. Sist. (Ussr), No. 11, 1970 p 99-105.

Descriptors: *Human reactions, *Physiological effects, *Rest, Auditory signals, Human performance, Hypodynamia, Nerves, Sensory stimulation, Visual signals.

For abstract, see STAR 1213

N74-22097/1GA PC$6.25/MF$1.45
California Univ., Berkeley. White Mountain Research Station.
WHITE MOUNTAIN RESEARCH STATION: 25 YEARS OF HIGH-ALTITUDE RESEARCH.
Final Technical Report.
N. Pace. 1973, 62p NASA-CR-138137
Contract NGR-05-003-018

Descriptors: *High altitude environments, *Laboratories, *Physiological effects, *Research

facilities, California, Data acquisition, Medical science, Research projects.

For abstract, see STAR 1213

N74-22530/1GA PC$4.25/MF$1.45
National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
DETERMINATION OF MECHANICAL PROPERTIES OF EXCISED DOG RADII FROM LATERAL VIBRATION EXPERIMENTS.
G. A. Thompson, M. Anliker, and D. R. Young. 1973, 22p NASA-TM-X-70037
Contracts NGL-05-020-223, GM-43015
Subm-Prepared in Cooperation with Stanford Univ.

Descriptors: *Bones, *Mathematical models, *Mechanical properties, *Vibration, Dogs, Resonant frequencies, Viscoelasticity.

For abstract, see STAR 1213

6T. Toxicology

AD-780 616/9GA Reprint
Edgewood Arsenal Aberdeen Proving Ground Md
PROPERTIES OF GB IN WATER.
Special publication,
Joseph Epstein. 21 Jun 73, 11p Rept no. EC-SP-74004
Availability: Pub. in Jnl. of the American Water Works Association, v66 n1 p31-37 Jan 74.

Descriptors: *GB agent, *Water supplies, Chemical analysis, Drinking water, Detection, Toxicity, Hydrolysis, Detoxification.
Identifiers: Water analysis.

At times the postulated situation of nerve gas entering community drinking-water supplies has had an unnerving effect. The author explains that it would be difficult to deposit a harmful amount into large drinking-water systems and that, were the gas to be dissolved into a supply source, it would under most circumstances, quickly lose its potency. The process of destroying the agent, moreover, can be accelerated by several methods. (Author)

AD-780 821/5GA PC$3.25/MF$1.45
Edgewood Arsenal Aberdeen Proving Ground Md
LABORATORY AND PILOT SCALE DETOXIFICATION OF VX IN ACIDIC MEDIA USING CHLORINE GAS.
Technical rept. Sep-Dec 72,
Jack H. Benson, Robert J. Valis, Stanley R. Kramer, David M. Heminger, and Herman F. Hildebrandt. May 74, 28p Rept no. EM-TR-73070

Descriptors: *VX agent, *Detoxification, *Chlorination, Hydrochloric acid, Chlorine, Destruction, Laboratory tests, Pilot studies, Stoichiometry, Reaction kinetics.
Identifiers: Taurine/N-N-diisopropyl, Phosphonic acid/methyl-(ethyl-ester), Urea/dicyclohexyl.

The purpose of this investigation was to study the possibility of destroying bulk quantities of VX dissolved in acid solution by sparging with chlorine gas. Laboratory experimentation using a batch process demonstrated the feasibility of chlorine detoxification and indicated the optimum conditions for detoxification. Three laboratory systems were scaled up for evaluation of detoxification efficiency on a pilot scale, using 100-lb charges of VX. The most efficient system studied in both laboratory and pilot work was one in which one volume of VX was dissolved in three volumes of 1.5 normal hydrochloric acid solution, followed by sparging with a stoichiometric amount of chlorine gas. Major reaction products included N,N-diisopropyltaurine, ethyl methylphosphonic acid, hydrochloric acid, and N,N'-dicyclohexylurea (from the VX stabilizer). It was concluded that the chlorination of VX in acid solution was an effective method of destroying bulk quantities of VX.

AD-780 849/6GA PC$3.00/MF$1.45
Army Medical Research Lab Fort Knox Ky
EVALUATION OF ORAL ADMINISTRATION OF ADENINE TO DOGS AND PRIMATES.
Progress rept.,
Charles E. Shields, John T. Ervin, and Mark G. Burns. 28 Mar 74, 13p Rept no. USAMRL-1090

Descriptors: *Adenine, *Blood preservation, Blood donors, Purines, Dogs, Primates, Tissues(Biology), Pathology, Toxicity, Lethal dosage, Ingestion(Physiology), Pharmacology, Intestines, Blood transfusion, Bioassay.

Little change was observed in primates fed 75 mg/kg adenine over the four-week period. Minimal tissue pathology was encountered upon completion of the study. In contrast to earlier studies in which oral feeding of adenine to dogs caused severe symptoms, and even death, the present subjects had very little symptomatic difficulty and some weight loss. Upon autopsy of the dogs, changes in renal tissue were found to support the possible adverse effect of adenine. The adenine presently used here was at least 95-99% pure and the dose of 75 mg/kg was higher than that given in most of the earlier studies, but a less effect was observed. This dose, when related to the 10 mg/kg considered to be the maximum for transfusion therapy, would suggest that a margin of safety does exist for use of adenine as a supplement to improve stored blood preservation. (Modified author abstract)

AD-780 998/1GA PC$4.00/MF$1.45
Army Foreign Science and Technology Center Charlottesville Va
THE PROBLEM OF MERCURY CONTAMINATION OF THE BIOLOGICAL ENVIRONMENT AND DOMESTIC ANIMALS,
Teresa Szprengier. 3 May 74, 9p Rept no. FSTC-HT-23-2298-72
Trans. of Medycyna Weterynaryjna (Poland) v27 n2 p82-86 1972.

Descriptors: *Mercury, *Contamination, *Pollution, Environments, Fungicides, Toxicity, Humans, Animals, Translations, Poland.
Identifiers: Food chains.

The toxicity of mercury and organic and inorganic mercury compounds in human and animal organisms is discussed, with a survey of the nature and extent of mercuric contamination of the environment, with particular stress on the role played by mercury-containing fungicides. (Author)

AD-781 031/0GA PC$9.00/MF$1.45
Aerospace Medical Research Lab Wright-Patterson AFB Ohio
PROCEEDINGS OF THE ANNUAL CONFERENCE ON ENVIRONMENTAL TOXICOLOGY (4TH) HELD AT FAIRBORN, OHIO, ON 16, 17, AND 18 OCTOBER 1973.
Final rept.
Dec 73, 438p* Rept no. AMRL-TR-73-125
Contract F33615-73-C-4059
See also AD-773 766.

Descriptors: *Toxicology, *Meetings, Environments, Toxic hazards, Thresholds(Physiology), Exposure(Physiology), Concentration(Composition), Chemicals, Gases, Carcinogens, Halogenated hydrocarbons, Solvents, Propellants.

The report is a compilation of the papers presented at the Proceedings of the 4th Annual Conference on Environmental Toxicology, sponsored by the University of California, Irvine and held in Fairborn, Ohio on 16, 17, and 18 October 1973. Major technical areas discussed included Toxic Substance Control Act of 1973; toxicology of halogenated solvents, aerosol propellants, and fire extinguishants; and toxicology of propellant, materials and assessment of carbinogenesis to certain materials. (Author)

BNWL-1818 PC$4.25/MF$1.45
Battelle Pacific Northwest Labs., Richland, Wash. (Usa).
TOXICOLOGY OF INHALED LOW-FIRED AND HIGH-FIRED BERYLLIUM OXIDES IN THE RAT AND HAMSTER.
C. L. Sanders, W. C. Cannon, G. J. Powers, and R. R. Adee. Apr 74, 25p
Contract AT(45-1)-1830

Descriptors: (*Hamsters, *Pathology), (*Rats, Pathology), (*Beryllium oxides, *Biological effects), Aerosols, Excretion, Inhalation, Liver, Particles, Skeleton, Toxicity, Urine.

For abstract, see NSA 30 01, number 02291.

PB-232 859/9GA PC$3.75/MF$1.45
Mason Research Inst., Worchester, Mass.
OTOTOXICITY OF CIS-DICHLORODIAMMINE PLATINUM (II)(NSC-119 875) IN GUINEA PIGS. PART I: AUDIOMETRY. PART II: HISTOPATHOLOGICAL EVALUATION.
Interim rept. Jun 72-May 74,
Robert F. Fleischman, Stanley W. Stadnicki, Michael F. Ethier, Ulrich Schaeppi, and David A. Cooney. 28 May 74, 60p MRI-CC04-74-22
Contract PHS-72-2055
See also PB-231 046.

Descriptors: *Antineoplastic agents, *Drugs, *Malignant neoplasms, *Toxicology, Bioassay, Guinea pigs, Bone marrow, Laboratory animals, Pharmacology, Ear, Histology, Intestines, Auditory defects, Labyrinth(Anatomy), Pathology, Kidney.
Identifiers: Platinum/diammino-dichloro, *Ototoxity, Preyers reflex.

Cis-dichlorodiammine platinum (NSC-119 875), an agent with potent antineoplastic activity which also induces renal, intestinal and bone marrow toxicity, was tested for ototoxic effects in guinea pigs. Ototoxicity was evaluated by the disappearance of Preyer's reflex in response to pure tones of 5, 7 and 10 kHz and by histopathological evaluation of the inner ear. Treatment with a single dose intraparenteral produced no specific ototoxicity whereas repeated daily treatments with 1 mg/kg, 5 x/week until hearing loss occurred, led to deafness in all animals without incidence of mortality. Vestibular toxicity was not observed. Phase contrast microscopy of surface preparations from the organ of Corti and mid-modiolar sections revealed loss of outer hair cells primarily in the basal turn of the cochlea. Hair cell lesions included degeneration, complete cytolysis and replacement with phalangeal scars. Occasional destruction of outer pillar cells and of a few inner hair cells, also occurred. Multiple treatments produced more severe lesions than single doses. Cis-dichlorodiammine platinum-induced lesions resembled those produced by other ototoxic agents except that inner hair cell lesions occurred less frequently.

7. CHEMISTRY

7A. Chemical Engineering

AD-780 995/7GA PC$4.00/MF$1.45
Army Foreign Science and Technology Center Charlottesville Va
CONVERSION OF LIQUID HYDROCARBONS,
M. Abidov, B. Ya. Goldfarb, L. P. Yanichkin, and A. S. Sultanov. 7 May 74, 5p Rept no. FSTC-HT-23-2451-72
Trans. of Patent (USSR) 282 573 p2 1970, by D. Trombley.

Descriptors: *Gas generating systems, *Hydrogen, *Catalysts, *Hydrocarbons, Iron alloys, Nickel alloys, Aluminum alloys, USSR, Translations, Patents, Conversion, Water vapor, High temperature.

The Russian patent refers to a method of catalytic conversion of liquid hydrocarbons for production

of hydrogen in the presence of water vapor. To reduce the carbon monoxide content it is proposed that an aluminum - nickel - iron catalyst with an oxidized surface be used.

AD-781 148/2GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
THE STUDY OF THE STAGED REMOVAL OF FINELY DISPERSED DUST CONTAINING FREE SIO2 FROM AIR USING VENTURI SCRUBBERS,
V. Ya. Averbukh, Ya. D. Averbukh, and V. A. Kuzmin. 17 Jun 74, 9p Rept no. FTD-HT-23-1316-74
Edited trans. of Uralskii Politekhnicheskii Institut, Sverdlovsk. Trudy (USSR) n205 p101-105 1972, by Ray E. Zarza.

Descriptors: *Venturi tubes, *Scrubbers, *Dust control, *Air cleaners, Silicon dioxide, Purification, Translations, USSR.
Identifiers: Indoor air pollution, Wet methods, Venturi separators.

In turbulent gas scrubbers of the 'Venturi tube' type, the removal of such dust from air can be quite effective. However, a device of this type demands large expenditures of electric power. Research on the absorption of ammonia and sulfur trioxide in Venturi tubes has indicated that rather good results can be attained by staged absorption with relatively small expenditures of electric power. Based on the similarity of the laws of the kinetics of absorption and wet dust trapping, it was decided to conduct an investigation of staged dust trapping in Venturi tubes.

AERE-M-2519 PC$3.25/MF$1.45
Ukaea Research Group, Harwell. Atomic Energy Research Establishment.
REVERSE OSMOSIS MEMBRANES CAST FROM A CELLULOSE ACETATE--METHANOL--DIOXAN DOPE.
D. Warren. Jan 74, 23p

Descriptors: (*Membranes, *Casting), (*Osmosis, Membranes), Acetates, Acetone, Catalysts, Cellulose, Chemical reactions, Dioxane, Heat treatments, Methanol, Performance, Temperature dependence.

For abstract, see NSA 30 01, number 02269.

PB-232 764/1GA PC$4.00/MF$1.45
Ecotrol, Inc., Columbia, Md.
ELECTROCHEMICAL REMOVAL OF HEAVY METALS FROM ACID MINE DRAINAGE.
Environmental protection technology series,
Nicholas B. Franco, and Robert A. Balouskus.
May 74, 97p EPA-670/2-74-023

Descriptors: *Industrial waste treatment, *Electrolysis, *Iron inorganic compounds, Mine waters, Precipitation(Chemistry), Oxidation, Cost estimates, Aeration, Capitalized costs, Operating costs, Beds(Process engineering), Electrolytic cells, Particles, Pilot plants, Field tests, Calcium, Magnesium, Manganese, Aluminum, Performance evaluation, Laboratory tests, Feasibility.
Identifiers: *Water pollution control, *Mine acid drainage, Electrolytic oxidation.

Laboratory and field studies were conducted to determine the economics of ferrous iron oxidation in a cell containing a bed of conductive particles in the space between the cathode and the anode. The effects of the process on other heavy metals present in acid mine drainage (AMD) and on the character of solids precipitated during treatment of low acidity water were also observed. A 18.9 liter/min (5 gal./min) pilot plant was operated at an actual mine site to evaluate treatment of 40 and 250 ppm ferrous iron AMD at pH levels of 2 and 5. A conventional aeration system was also included to generate comparative data. Estimates for a 473 liter/min (125 gal./min) plant based on the pilot data for oxidation only indicate that capital and operating costs for electrochemical treatment would be higher than those for aeration by factors of 5 and 1.7 respectively. (Modified author abstract)

PB-233 035/5GA PC$12.00/MF$1.45
Culligan International Co., Northbrook, Ill.
FIELD TESTING OF IMPROVED ION EXCHANGE TECHNIQUES.
Research and development progress rept. Apr 72-Jun 74,
S. A. Bresler, F. Husseini, and E. Kreusch. Jun 74, 177p Int-OSW-RDPR-74-970
Contract DI-14-30-3059
Prepared in cooperation with Bresler and Associates, Inc., New York.

Descriptors: *Ion exchanging, *Desalting, *Ion exchange resins, Tests, Pilot plants, Performance evaluation, Brackish water, Beds(Process engineering), Feasibility.

Pilot plant field tests were conducted at four sites to evaluate the potential of some new ion exchange techniques to desalt certain brackish waters. A three bed and four bed system were evaluated. The first bed contains a weak-acid resin, the second bed a strong-acid resin in the hydrogen form, and the third bed a weak-base or intermediate-base resin. In the four bed process, a fourth resin bed contains a strong-acid resin in the sodium form, through which a portion of the water passes. A review of the data indicates that resin performance was in substantial agreement with previously predicted values.

PB-233 043/9GA PC$8.75/MF$1.45
General Atomic Co., San Diego, Calif.
RESEARCH AND DEVELOPMENT OF COMPOSITE MEMBRANE TECHNOLOGY.
Research and development progress rept.,
R. L. Riley, C. R. Lyons, G. R. Hightower, M. Tagami, and F. K. Lesan. May 74, 115p GA-A12866 Int-OSW-RDPR-74-968
Contract DI-14-30-3016

Descriptors: *Membranes, *Desalting, Pilot plants, Performance evaluation, Cellulose acetate, Feedwater treatment, Sea water.
Identifiers: *Spiral wound membranes, *Reverse osmosis desalination.

A single-stage seawater test plant was designed, constructed, and made operational using the cellulose 2.83 acetate thin-film (250 A) composite membrane in the spiral-wound configuration. The plant, located at Seaworld on Mission Bay in San Diego, California, operates on unacidified seawater (pH = 8.0) at an applied pressure of 68 atm (1000 psi) with 24 2-in. by 10-3/4-in. spiral-wound elements, each containing approximately 4 sq. ft. of membrane. The seawater feed is pretreated by chlorination and sand filtration. The potable product water contains approximately 90 ppm total dissolved salts. The sodium chloride rejection is 99.75%. (Modified author abstract)

PB-233 051/2GA PC$7.75/MF$1.45
Dow Chemical Co., Midland, Mich.
LABORATORY PROGRAM OF STUDY FLASHING AND SCALING CHARACTERISTICS OF GEOTHERMAL BRINES.
Research and development progress rept.,
J. S. Wilson, and G. R. Warren. Jun 73, 94p Int-OSW-RDPR-74-696
Contract DI-14-30-2936

Descriptors: *Desalting, *Brines, *Flashing, Geothermy, Hydrogen sulfide, Boric acids, Scale(Corrosion), Precipitation(Chemistry), Scaling, Flocculating, Silicon dioxide, Suspended sediments, Calcium carbonates, pH, Water treatment, Distillation equipment.
Identifiers: Multistage flash distillation.

The purpose of this project was to identify and study problems associated with the production of desalted water in a dual-purpose geothermal flash plant. The investigation was carried out by controlled flashing of a brine, prepared to simulate the geothermal brine expected to be found in the Imperial Valley of California. Anticipated problem areas were boric acid and hydrogen sulfide carryover into the product water, solids in the waste stream, scaling in the flash equipment and corrosion. One unexpected problem, low pH of the product water, was encountered. Scaling did not occur but may be a problem in a continuous plant. Corrosion of 316 stainless steel, nickel, and monel did occur but no rates were determined. (Modified author abstract)

PB-233 068/6GA PC$3.75/MF$1.45
Alaska Univ., College. Inst. of Water Resources.
ORGANIC AND COLOR REMOVAL FROM WATER SUPPLIES BY SYNTHETIC RESINOUS ADSORBENTS.
Completion rept.,
Timothy Tilsworth. Jan 74, 56p IWR-50 W74-09050, OWRR-A-034-ALAS(1)

Descriptors: *Organic compounds, *Color, *Adsorbents, *Ion exchange resins, *Water treatment, Iron, Sewage treatment, Columns(Process engineering), Cost estimates.
Identifiers: Water pollution control.

An experimental study was conducted to evaluate the effectiveness of synthetic resinous adsorbents for removing color and organics from water supplies. Four different resins were tested with water from three individual sources. The results show that synthetic resinous adsorbents were effective in removing color and organics. In general, the resins performed best from moderate concentrations of color and organics. Relatively good color removal was achieved on the sewage treatment plant effluent. The use of synthetic resinous adsorbents appears to hold promise for treatment of relatively small water supplies containing color and organics. The economics of such systems needs further evaluation.

PB-233 101/5GA PC$7.25/MF$1.45
Westinghouse Research Labs., Pittsburgh, Pa.
EVALUATION OF THE FLUIDIZED-BED COMBUSTION PROCESS, VOLUME IV. FLUIDIZED-BED OIL GASIFICATION/DESULFURIZATION.
Environmental protection technology series,
D. L. Keairns, D. H. Archer, R. A. Newby, E. P. O'Neill, and E. J. Vidt. Dec 73, 320p* EPA-650/2-73-048d
Contract EPA-68-02-0217

Descriptors: *Fluidized bed processing, *Gasification, *Desulfurization, *Crude oil, Limestone, Electric power generation, Manufactured gas, Engineering drawings, Regeneration(Engineering), Dolomite(Rock), Pressure, Flow charts, Sorbents, Solid waste disposal, Cost estimates, Design, Industrial plants, Calcium sulfides, Reaction kinetics.
Identifiers: *Air pollution abatement, Low sulfur fuels.

The report presents: results of a process evaluation of the pressurized fluidized-bed combustion (FBC) system for power generation; preliminary plans and a cost estimate for a 30-MW pressurized FBC boiler development plant; identification of a project team and program to demonstrate FB oil gasification/desulfurization for power generation of a 50-MW plant; and evaluation of pressurized oil gasification for combined-cycle power generation. It identifies no problems which preclude the development of pressurized FBC combined-cycle power plants and FB oil gasification power plants which can generate electrical energy within environmental goals at lower energy costs than competitive systems. Work reported here, a continuation of earlier FBC process evaluation efforts, is aimed at the development and demonstration of

these FB fuel processing systems. Portions of this document are not fully legible.

PB-233 112/2GA PC-GPO/MF$1.45-NTIS
Fitzsimons Steel Co., Youngstown, Ohio.
SULFURIC ACID AND FERROUS SULFATE RECOVERY FROM WASTE PICKLE LIQUOR.
Environmental protection technology series,
Joseph K. Seyler, William E. Thornton, and Michael K. Householder. Jan 74, 82p W74-08945, EPA-660/2-73-032
Sponsored in part by Office of Water Resources Research, Washington, D.C.
Paper copy available from GPO $1.20 as EP1.23:660/2-73-032.

Descriptors: *Pickling compositions, *Industrial waste treatment, *Sulfuric acid, *Materials recovery, Reclamation, Operating costs, Crystallization, Cost estimates, Iron sulfates, Capitalized costs, Chemical cleaning, Design, Process charting, Iron and steel industry.
Identifiers: *Water pollution abatement, Waste recycling.

A bath bar pickler and a bath rod pickler are used for cleaning 40,000 tons per year of cold-rolled steel using sulfuric acid at the Fitzsimons Steel Company's Youngstown, Ohio plant. A facility for the treatment of the spent pickle liquor including rinse water was installed based on the vacuum crystalization process of Keram Chemi-Lurgi. This process recovers ferrous sulfate heptahydrate as a nearly dry solid by-product and recovers the unreacted acid for recycle to the pickling tank thus eliminating the discharge of spent pickle liquor and rinse water. This report describes the investigation of process variables and the demonstration of the process at full scale. Costs are discussed. (Modified author abstract)

PB-233 116/3GA PC$4.00/MF$1.45
Gulf South Research Inst., Baton Rouge, La.
CHARACTERIZATION OF WASTEWATERS FROM THE ETHICAL PHARMACEUTICAL INDUSTRY.
James H. Mayes. Jul 74, 77p* EPA-670/2-74-057
Contract EPA-R-801159

Descriptors: *Drug industry, *Chemical industry, *Industrial wastes, *Water pollution, Industrial waste treatment, Biodeterioration, Classification, Fermentation, Effluents.
Identifiers: Water pollution control.

The available information allowed a breakdown into (1) pharmaceutical (formulation) plants, (2) pharmaceutical and chemical (sythesis) plants, and (3) all others (those using fermentation, biological preparation, extraction, and combinations). Analysis of the collected raw effluent data indicated that sanitary wastes were a major contributor in pharmaceutical plants. The wastes of the other categories were more dependent on specific operations and were, consequently, more variable. Fermentation wastes were, as expected, very high in biodegradable organics and usually were the predominant contributor in complex plants. Conventional biological treatment, both in-plant and at central facilities, is widely used and appears capable of achieving 90% removal of degradable organics. Advanced technology appears to be limited in application to specific wastes not amenable to biological treatment.

PB-233 132/0GA PC-GPO/MF$1.45-NTIS
Culligan International Co., Northbrook, Ill.
INDUSTRIAL WATER SOFTENER WASTE BRINE RECLAMATION.
Environmental protection technology rept.,
Jim Burton, and Ed Kreusch. Feb 74, 167p EPA-660/2-74-007, W74-08941
Paper copy available from GPO $1.95 as stock no. EP1.23:660/2-74-007.

Descriptors: *Brines, *Demineralizers, *Regeneration(Engineering), *Lime-soda ash process, Tables(Data), Experimental data, Industrial waste treatment, Cost estimates, Ion exchanging, Water softening.
Identifiers: *Water pollution control, Waste recycling.

Discharge of brine wastes from water softener regeneration to sewers or receiving streams is often undesirable because of possible pollution. Brine reclamation and reuse has been studied for one year at a central regeneration plant for portable ion exchange water softeners. The process is modified lime-soda softening and is operated in daily batches. This process produces a 95% sodium chloride brine, which is perfectly acceptable for reuse as a regenerant brine. The lime-soda softening sludge is the only waste. This process is feasible technically, but is marginal economically. Performance data and cost estimate are included. (Modified author abstract)

PB-233 137/9GA PC-GPO/MF$1.45-NTIS
Metcalf and Eddy, Inc., Boston, Mass.
CHEMICAL/PHYSICAL AND BIOLOGICAL TREATMENT OF WOOL PROCESSING WASTES.
Environmental protection technology series rept.,
Lester T. Hatch, Ronald E. Sharpin, and W. T. Wirtanen. Jan 74, 66p W74-09064 , EPA-660/2-73-036
Paper copy availab le from GPO $1.05 as EP1.23:660/2-73-036.

Descriptors: *Industrial waste treatment, *Wool, *Textile industry, Greases, Washing, Scouring, Rinsing, Cracking process, Acid treatment, Biochemical oxygen demand, Activated sludge process, Clarification, Lagoons(Ponds), Pilot plants, Process charting, Suspended sediments, Cost estimates, Sludge disposal, Aeration, Settling.
Identifiers: Chemical oxygen demand, *Water pollution control, Dissolved solids.

Elevated temperature acid-cracking combined with pilot activated sludge and solids. The chemical/physical system consisted of a hot acid-cracking process to reduce the grease content in the influent to the biological system. The biological system consisted of a pilot extended aeration activated sludge unit with clarification and retention in a pilot facultative lagoon (53 days' retention). Cost estimates and sludge disposal are also discussed. (Modified author abstract)

PB-233 139/5GA PC-GPO/MF$1.45-NTIS
Institute of Paper Chemistry, Appleton, Wis.
TREATMENT OF SULFITE EVAPORATOR CONDENSATES FOR RECOVERY OF VOLATILE COMPONENTS.
Environmental protection technology rept.,
Kenneth W. Baierl, Nai L. Chang, Bernard F. Lueck, Averill J. Wiley, and Robert A. Holm. Dec 73, 181p EPA-660/2-73-030, W74-09066
Grant EPA-S-801207
Paper copy available from GPO $2.10 as stock no. EP1.23:660/2-73-030.

Descriptors: *Sulfite pulping, *Materials recovery, *Sulfite cooking liquors, Acetic acid, Condensates, Industrial waste treatment, Activated carbon treatment, Biochemical oxygen demand, Sulfur dioxide, Methyl alcohol, Paper industry, Furfurals, Pilot plants, Stripping(Distillartion), Steam, Regeneration(Engineering), Flow charts, Ethyl acetate, Evaporators.
Identifiers: *Water pollution control, Chemical oxygen demand.

A pilot plant study of a process to recover the volatile constituents of the condensate derived from the evaporation of a sulfite spent wood pulping liquor has been made. The data from this one-year evaluation confirm prior work demonstrating that recovery of sulfur dioxide, furfural, methanol, and acetic acid (in the form of ethyl acetate) will yield reusable and salable materials, and provide 60 90% BOD reduction. The work reported covers four major sections: (1) Assay of condensate samples from supporting mills; (2) Operation and data of a pilot system comprising steam stripping, activated carbon adsorption, and fractional distillation; (3) Mass, heat, and BOD balances made according to the actual operating condition of the pilot plant at the Appleton Division mill of Consolidated Papers, Inc. to January 1973; and (4) Low temperature (200C) regeneration of carbon. Mass and heat balances, recoverable product values, and credits for BOD removal combine to show the process to be a favorable avenue for the elimination of the pollution potential of the sulfite condensate waste. (Modified author abstract)

PB-233 143/7GA PC-GPO/MF$1.45-NTIS
Anaconda American Brass Co., Westbury, Conn. Engineered Environments Div.
METALLIC RECOVERY FROM WASTE WATERS UTILIZING CEMENTATION.
Environmental protection technology series,
Oliver P. Case. Jan 74, 44p EPA-670/2-74-008, W74-09062
Grant EPA-S-802254
Paper copy available from GPO $0.85 as stock no. EP1.23:670/2-74-008.

Descriptors: *Industrial waste treatment, *Reduction(Chemistry), *Copper, *Chromium, Chromates, Iron, Electrochemistry, Reducing agents, Materials recovery, Zinc, Precipitation(Chemistry), Metal industry, Brasses, Waste water, Ferrosilicon, pH.
Identifiers: *Water pollution control, *Cementation.

The report presents the results of a series of bench-scale experiments using the so-called 'cementation' reaction (i.e. electrochemical reduction by contact with a metal of higher oxidation potential) for the precipitation of copper and the reduction of hexavalent chromium in industrial waste streams such as brass mill and metal finishing discharges. Reluctants studied included soft iron shot, particulate iron, and silicon alloys in granular form. The bulk of the work was done using the iron shot as a reductant. Studies were carried out by both a batch process and a continuous process (black-mix reactor). Results were evaluated in terms of percent reduction, dissolution of excess iron and change in pH vs time. (Modified author abstract)

PB-233 151/0GA PC$11.25/MF$1.45
Fluor Corp. Ltd., Los Angeles, Calif.
SUMMARY OF DESALINATION PLANT BRINE DISPOSAL METHODS FOR INLAND LOCATIONS.
Final rept.
Feb 71, 165p Int-OSW-RDPR-74-978
Contract DI-14-01-0001-1286

Descriptors: *Liquid waste disposal, *Brines, *Desalting, *Solidification, Granulation, Evaporation, Industrial plants, Cost estimates, Crystallization, Fluidized bed processing, Design, Solar energy, Process charting, Feedwater treatment.
Identifiers: Multistage flash distillation, Seeding.

The report attempts to determine what process or combination of processes have most potential for economic concentration of desalting plant effluent to solids. The scope was limited to effluent from multi-stage flash (MSF) plants. Evaporator-based processes involving seeding and crystallization and solar evaporation and combination processes are discussed. Cost estimates are included. No one process is best for all water types.

PB-233 155/1GA PC$11.50/MF$1.45
Burns and Roe Construction Corp., Paramus, N.J.
MANAGEMENT, OPERATION AND MAINTENANCE OF BRACKISH WATER TEST FACILITY CONDUCTED AT ROSWELL TEST

FACILITY, ROSWELL, NEW MEXICO JULY 1970-APR 1972.
Research and development progress rept.,
Anthony R. Bernardi, and P. M. Mothes. May 74, 166p Int-OSW-RDPR-74-981
Contract DI-14-30-2618

Descriptors: *Desalting, *Brackish water, *Distillation, Industrial plants, Maintenance, Corrosion prevention, Heat exchangers, Heat transfer, Industrial engineering, New Mexico.
Identifiers: Vapor compression distillation, Reverse osmosis desalination.

This report describes logistical support necessary to maintain the Brackish Water Test Center and all Pilot Test Units located at the Roswell Test Facility. The following equipment and facilities were supported: Test bed plant, reverse osmosis, boiler and blend room, pump loop test building, safety, laboratory activities and analysis and inspection and overhaul of the test bed plant.

PB-233 158/5GA PC$16.75/MF$1.45
Aqua-Chem, Inc., Waukesha, Wis.
200 MGD DESALTING PLANT CONCEPTUAL STUDY, ADVANCED THIN FILM DISTILLATION PROCESS AND TEST MODULE DESIGN.
Research and development progress rept.
Oct 70, 272p Int-OSW-RDPR-74-979
Contract DI-14-30-2637
Prepared in cooperation with Bechtel Corp., San Francisco, Calif.

Descriptors: *Desalting, *Distillation, Prototypes, Design, Cost estimates, Heat transfer, Process charting, Feedwater treatment, Fluid dynamics, Instrumentation, Plant location, Site surveys, Sea water.
Identifiers: Vertical tube evaporation, Horizontal tube evaporation, Multistage flash distillation.

The request for proposal from the Office of Saline Water calls for the preparation of a conceptual design study of a 200 MGD sea water distillation desalting plant. This large sized plant, intended for construction start about 1976, will bridge the technological gap between present distillation plants and the very large plants of the future. As a first phase of this program, OSW has requested a design for a test module that would firmly establish the process technologies and projected economics of the 200 MGD plant.The comprehensive preliminary design and cost comparison work has been completed and is covered by this report.

PB-233 170/0GA PC$33.00/MF$1.45
Catalytic, Inc., Philadelphia, Pa.
MSF DISTILLATION PLANT (MODULE), VERTICAL TUBE EVAPORATION (VTEX), SEMI-ANNUAL REPORT JUNE 1, 1970, THROUGH DECEMBER 31, 1970.
Research and development progress rept.,
M. C. Bushkoff. May 74, 597p Int-OSW-RDPR-74-980
Contract DI-14-30-2652

Descriptors: *Desalting, *Distillation equipment, Heat transfer, Heat balance, Mass transfer, Tubes, Process charting, Instrumentation, Performance evaluation.
Identifiers: Vertical tube evaporation, Fluted tubes.

This report is on the development work on the Vertical Tube Bundle Test Vehicle (VTEX). Its primary purpose is to obtain design information for large bundles of doubly fluted tubes. The development activities covered include large bundle heat transfer performance, brine hydraulics, vapor-liquid separation, bundle venting, and materials evaluation. Process descriptions and updated flowsheets are presented together with design and actual mass and energy balances. Plant performance, equipment and materials evaluation are discussed. The Multi-Stage Flash (MSF) Test Module was operated only during intermittant shut-downs of the VTEX, and its development program was, of necessity, small. (Modified author abstract)

PB-233 171/8GA PC$17.50/MF$1.45
Burns and Roe Construction Corp., Paramus, N.J.
ANNUAL REPORT. SAN DIEGO TEST FACILITY, JANUARY 1, 1971-FEBRUARY 15, 1972.
Research and development progress rept.
May 74, 290p Int-OSW-RDPR-74-977
Contract DI-14-30-2742

Descriptors: *Desalting, *Distillation, Research, Water softening, Heat transfer, Corrosion, Process charting, Distillation equipment.
Identifiers: Multistage flash distillation, Vertical tube evaporation, Lime magnesium carbonate demineralization process, Horizontal tube evaporation.

The annual progress report for the San Diego Test Facility located at Chula Vista, California is presented. The report covers the technical and operational results for the Senator Clair Engle Plant (CEP), the high temperature Effect 1A (E1A), the (MSF) Flash Distillation Module, the Vertical Tube Evaporator Experimental Plant (VTEX), and the Lime Magnesium Carbonate (LMC) Plant. Also included are progress summaries in the area of material evaluation and development, chemistry related items, component evaluation studies, plant modifications, operational statistics and techniques, and support areas conducted by the Burns and Roe New Jersey office. (Modified author abstract)

PB-233 185/8GA PC$12.75/MF$1.45
Badger (W. L.) Associates, Inc., Ann Arbor, Mich.
VTE EVAPORATORS FOR GEOTHERMAL BRINES.
Research and development progress rept.,
F. C. Standiford. Jun 72, 191p Int-OSW-RDPR-74-975
Contract DI-14-30-2955

Descriptors: *Evaporators, *Desalting, Fouling, Brines, Geothermy, Cost estimates, Design, Heat transfer, Temperature, Plant layout, Distillation equipment, Engineering drawings, Capitalized costs, Operating costs, Process charting.
Identifiers: *Vertical tube evaporation.

Conceptual designs and costs for VTE (Vertical Tube Evaporation) evaporators to desalt hot geothermal brines are discussed. Basic unit capacity was 4 MGD and brine feed temperature 400F. Variables investigated included physical arrangement, upflow versus downflow heat transfer, feed brine temperature, product recovery ratio, and means of heat rejection. A five-effect downflow VTE rejecting heat to water used for reservoir recharge gave the lowest product cost (11.24 cents/1,000 gallons, exclusive of labor) at 90 percent load factor and 12 percent total charges on capital investment.

PB-233 186/6GA PC$8.25/MF$1.45
Bowles Fluidics Corp., Silver Spring, Md.
PRELIMINARY EVALUATION OF FLUIDIC TECHNIQUES FOR FLOW MODULATION IN THE MULTI-STAGE FLASH DISTILLATION PROCESS.
Research and development progress rept.,
P. A. Freeman. Jan 71, 105p Int-OSW-RDPR-74-974
Contract DI-14-01-0001-2226

Descriptors: *Flow control, *Desalting, Modulation, Brines, Fluid flow, Liquid level control, Engineering diagrams, Jet flow, Vortices, Bubbles, Flashing, Design.
Identifiers: *Multistage flash distillation.

A preliminary evaluation of five fluidic flow modulation techniques to control the flow rate of flashing brine through a typical multi-stage flash distillation plant was performed as the initial phase of development of a fluidic automatic brine level control system for the MSF process. A flow modulator based on the fluidic vortex amplifier concept was selected. This concept potentially modulates brine flows to 50% of full flow by bypassing less than 5% of full brine flow from an upstream stage. A preliminary design for the complete brine level control system is presented, based on the vortex modulator and other fluidic techniques.

PB-233 259/1GA PC$18.75/MF$1.45
Consolidation Coal Co., Library, Pa. Research Div.
CONSOL SYNTHETIC FUEL PROCESS DEVELOPMENT. MONTHLY PROGRESS REPORT NUMBERS 1 THROUGH 50.
Monthly repts. Aug 63-Sep 67.
Jul 74, 315p
Contract DI-14-01-0001-310
See also PB-233 260.

Descriptors: *Coal, *Synthetic oils, *Hydrogenation, *Liquefaction, Pilot plants, Byproducts, Materials recovery, Zinc chlorides, Cracking process.
Identifiers: Project Gasoline.

These monthly reports (Aug 63-Sept 67) trace the progress of the development of the Consol Synthetic Fuel (CSF) process by the Consolidation Coal Company under contract to the Office of Coal Research. The process, tested for nearly three years in a pilot plant at Cresap, West Virginia, involves the partial conversion of coal into an extract and a byproduct solid residue, followed by hydrogenation of the extract to yield a synthetic crude. Most of the development work--carried out under the code name 'Project Gasoline'--applied to caking, high-sulfur Eastern coals.

PB-233 260/9GA PC$20.00/MF$1.45
Consolidation Coal Co., Library, Pa. Research Div.
CONSOL SYNTHETIC FUEL PROCESS DEVELOPMENT. MONTHLY PROGRESS REPORTS NUMBERS 51 THROUGH 77.
Monthly repts. Oct 67-Dec 69.
Jul 74, 336p
Contract DI-14-01-0001-310
See also PB-233 259 and PB-233 261.

Descriptors: *Coal, *Synthetic oils, *Hydrogenation, *Liquefaction, Pilot plants, Byproducts, Materials recovery, Zinc chlorides, Cracking process.
Identifiers: Project Gasoline.

These monthly reports (Oct 67 to Dec 69) trace the progress of the development of the Consol Synthetic Fuel (CSF) process by the Consolidation Coal Company under contract to the Office of Coal Research. The process, tested for nearly three years in a pilot plant at Cresap, West Virginia, involves the partial conversion of coal into an extract and a byproduct solid residue, followed by hydrogenation of the extract to yield a synthetic crude. Most of the development work--carried out under the code name 'Project Gasoline'--applied to caking, high-sulfur Eastern coals.

PB-233 261/7GA PC$14.00/MF$1.45
Consolidation Coal Co., Library, Pa. Research Div.
CONSOL SYNTHETIC FUEL PROCESS DEVELOPMENT. MONTHLY PROGRESS REPORTS NUMBERS 78 THROUGH 116.
Monthly repts. Jan 70-Mar 73.
Jul 74, 219p
Contract DI-14-01-0001-310
See also PB-233 260.

Descriptors: *Coal, *Synthetic oils, *Hydrogenation, *Liquefaction, Pilot plants, Byproducts, Materials recovery, Zinc chlorides, Cracking process.
Identifiers: Project Gasoline.

These monthly reports (Jan 70 to Mar 73) trace the progress of the development of the Consol Synthetic Fuel (CSF) process by the Consolidation Coal Company under contract to the Office of Coal Research. The process, tested for nearly three years in a pilot plant at Cresap, West Virginia, involves the partial conversion of coal into an extract and a byproduct solid residue, followed by hydrogenation of the extract to yield a synthetic crude. Most of the development work--carried out under the code name 'Project Gasoline'--applied to caking, high-sulfur Eastern coals.

PB-233 262/5GA PC$16.75/MF$1.45
FMC Corp., Princeton, N.J. Chemical Research and Development Center.
CHAR OIL ENERGY DEVELOPMENT. MONTHLY REPORTS NUMBER 1 THROUGH 18.
Monthly rept. Oct 66-Mar 68,
Jul 74, 271p
Contract DI-14-01-0001-498
See also PB-233 263.

Descriptors: *Coal gasification, *Manufactured gas, *Synthetic oils, *Fluidized bed processors, *Desulfurization, Pilot plants, Pyrolysis, Liquefaction, Hydrogenation.
Identifiers: *Char, COED(Char Oil Energy Development), Low sulfur fuels.

These monthly reports (Oct 66-Mar 68) trace the progress of the development of the COED (char-oil-energy-development) process--from bench scale to pilot plant operations at Princeton, New Jersey--by the FMC Corporation under contract (14-01-0001-498) to the Office of Coal Research. Under development since 1962, the COED process converts coal to low-sulfur synthetic crude oil, gas, and char by the fluidized-bed pyrolysis of coal, followed by the hydrotreating of the coal oil to synthetic crude oil. The char can be gasified to give a clean fuel gas for power generation, thus re-opening the potential of using high sulfur coals for power generation. Successful operation of a 100-pound-per-hour process development unit led to the design, construction, and operation of a pilot plant at Princeton. The pilot plant can process 36 tons of coal per day and hydrotreat 30 barrels of coal-derived oil daily.

PB-233 264/1GA PC$17.00/MF$1.45
FMC Corp., Princeton, N.J. Chemical Research and Development Center.
CHAR OIL ENERGY DEVELOPMENT. MONTHLY REPORTS NUMBERS 38 THROUGH 59.
Monthly repts. Nov 69-Aug 71.
Jul 74, 280p
Contract DI-14-01-0001-498
See also PB-233 263.

Descriptors: *Coal gasification, *Manufactured gas, *Synthetic oils, *Fluidized bed processors, *Desulfurization, Pilot plants, Pyrolysis, Liquefaction, Hydrogenation.
Identifiers: *Char, COED(Char Oil Energy Development), Low sulfur fuels.

These monthly reports (Nov 69-Aug 71) trace the progress of the development of the COED (char-oil-energy-development) process--from bench scale to pilot plant operations at Princeton, New Jersey--by the FMC Corporation under contract (14-01-0001-498) to the Office of Coal Research. Under development since 1962, the COED process converts coal to low-sulfur synthetic crude oil, gas, and char by the fluidized-bed pyrolysis of coal, followed by the hydrotreating of the coal oil to synthetic crude oil. The char can be gasified to give a clean fuel gas for power generation, thus re-opening the potential of using high sulfur coals for power generation. Successful operation of a 100-pound-per-hour process development unit led to the design, construction, and operation of a pilot plant at Princeton. The pilot plant can process 36 tons of coal per day and hydrotreat 30 barrels of coal-derived oil daily.

PB-233 265/8GA PC$20.75/MF$1.45
FMC Corp., Princeton, N.J. Chemical Research and Development Center.
CHAR OIL ENERGY DEVELOPMENT. MONTHLY REPORTS NUMBERS 1 THROUGH 13.
Monthly repts. for Sep 71-Sep 72.
Jul 74, 353p
Contract DI-14-32-0001-1212
See also PB-233 266.

Descriptors: *Coal gasification, *Manufactured gas, *Synthetic oils, *Fluidized bed processors, *Desulfurization, Pilot plants, Pyrolysis, Liquefaction, Hydrogenation.
Identifiers: *Char, COED(Char Oil Energy Development), Low sulfur fuels.

These monthly reports (Sept 71-Sept 72) trace the progress of the development of the COED (char-oil-energy-development) process--from bench scale to pilot plant operations at Princeton, New Jersey--by the FMC Corporation under contract (14-01-0001-1212) to the Office of Coal Research. Under development since 1962, the COED process converts coal to low-sulfur synthetic crude oil, gas, and char by the fluidized-bed pyrolysis of coal, followed by the hydrotreating of the coal oil to synthetic crude oil. The char can be gasified to give a clean fuel gas for power generation, thus re-opening the potential of using high sulfur coals for power generation. Successful operation of a 100-pound-per-hour process development unit led to the design, construction, and operation of a pilot plant at Princeton. The pilot plant can process 36 tons of coal per day and hydrotreat 30 barrels of coal-derived oil daily.

PB-233 266/6GA PC$18.75/MF$1.45
FMC Corp., Princeton, N.J. Chemical Research and Development Center.
CHAR OIL ENERGY DEVELOPMENT. MONTHLY REPORTS NUMBERS 14 THROUGH 19.
Monthly repts. Oct 72-Mar 73.
Jul 74, 314p
Contract DI-14-32-0001-1212
See also PB-233 265, and PB-233 267

Descriptors: *Coal gasification, *Manufactured gas, *Synthetic oils, *Fluidized bed processors, *Desulfurization, Pilot plants, Pyrolysis, Liquefaction, Hydrogenation.
Identifiers: *Char, COED(Char Oil Energy Development), Low sulfur fuels.

These monthly reports (Oct 72-Mar 73) trace the progress of the development of the COED (char-oil-energy-development) process--from bench scale to pilot plant operations at Princeton, New Jersey--by the FMC Corporation under contract 14-01-0001-1212 to the Office of Coal Research. Under development since 1962, the COED process converts coal to low-sulfur synthetic crude oil, gas, and char by the fluidized-bed pyrolysis of coal, followed by the hydrotreating of the coal oil to synthetic crude oil. The char can be gasified to give a clean fuel gas for power generation, thus re-opening the potential of using high sulfur coals for power generation. Successful operation of a 100-pound-per-hour process development unit led to the design, construction, and operation of a pilot plant at Princeton. The pilot plant can process 36 tons of coal per day and hydrotreat 30 barrels of coal-derived oil daily.

PB-233 267/4GA PC$17.75/MF$1.45
FMC Corp., Princeton, N.J. Chemical Research and Development Center.
CHAR OIL ENERGY DEVELOPMENT. MONTHLY REPORTS NUMBERS 20 THROUGH 26.
Monthly repts. Apr-Oct 73.
Jul 74, 295p
Contract DI-14-32-0001-1212
See also PB-233 266.

Descriptors: *Coal gasification, *Manufactured gas, *Synthetic oils, *Fluidized bed processors, *Desulfurization, Pilot plants, Pyrolysis, Liquefaction, Hydrogenation.
Identifiers: *Char, COED(Char Oil Energy Development), Low sulfur fuels.

These monthly reports (Apr 73-Oct 73) trace the progress of the development of the COED (char-oil-energy-development) process--from bench scale to pilot plant operations at Princeton, New Jersey--by the FMC Corporation under contract 14-01-0001-1212 to the Office of Coal Research. Under development since 1962, the COED process converts coal to low-sulfur synthetic crude oil, gas, and char by the fluidized-bed pyrolysis of coal, followed by the hydrotreating of the coal oil to synthetic crude oil. The char can be gasified to give a clean fuel gas for power generation, thus reopening the potential of using high sulfur coals for power generation. Successful operation of a 100-pound-per-hour process development unit led to the design, construction, and operation of a pilot plant at Princeton. The pilot plant can process 36 tons of coal per day and hydrotreat 30 barrels of coal-derived oil daily.

PB-233 268/2GA PC$21.25/MF$1.45
FMC Corp., Princeton, N.J. Chemical Research and Development Center.
CHAR OIL ENERGY DEVELOPMENT. MONTHLY REPORTS NUMBERS 27 THROUGH 32.
Monthly repts., Nov 73-Apr 74,
Nov 73, 364p
Contract DI-14-32-0001-1212
See also PB-233 267.

Descriptors: *Coal gasification, *Manufactured gas, *Synthetic oils, *Fluidized bed processors, *Desulfurization, Pilot plants, Pyrolysis, Liquefaction, Hydrogenation.
Identifiers: *Char, COED(Char Oil Energy Development), Low sulfur fuels.

These monthly reports (Nov 73-Apr 74) trace the progress of the development of the COED (char-oil-energy-development) process--from bench scale to pilot plant operations at Princeton, New Jersey--by the FMC Corporation under contract 14-01-0001-1212 to the Office of Coal Research. Under development since 1962, the COED process converts coal to low-sulur synthetic crude oil, gas, and char by the fluidized-bed pyrolysis of coal, followed by the hydrotreating of the coal oil to synthetic crude oil. The char can be gasified to give a clean fuel gas for power generation, thus reopening the potential of using high sulfur coals for power generation. Successful operation of a 100-pound-per-hour process development unit led to the design, construction, and operation of a pilot plant at Princeton. The pilot plant can process 36 tons of coal per day and hydrotreat 30 barrels of coal-derived oil daily.

PB-233 277/3GA PC$18.50/MF$1.45
Pittsburg and Midway Coal Mining Co., Kansas City, Mo.
SOLVENT REFINED COAL (SRC) PROCESS.
Monthly rept. nos. 1 thru 13, Oct 66-Oct 67.
Oct 67, 308p
Contract DI-14-01-0001-496
See also Monthly rept. nos. 14-27, PB-233 278.

Descriptors: *Coal preparation, *Hydrogenation, Pilot plants, Organic solvents, Ash content, Materials recovery, Ashes, Liquefaction.
Identifiers: *Solvent refining, Solvent refined coal.

These monthly reports trace the progress of the Solvent Refined Coal (SRC) process developed by the Pittsburg and Midway Coal Mining Co. under contract to the Office of Coal Research since 1966. The process will undergo testing in a pilot plant recently completed near Tacoma, Washington, at a cost of $18 million. In the SRC process, coal is first dissolved under moderate hydrogen pressure

in a heavy aromatic solvent derived from the process. The resultant coal solution is filtered to remove ash and a small amount of insoluble organic material and fractionated to recover the solvent. The main product from the process is a heavy organic material called solvent refined coal. Smaller quantities of hydrocarbon gases and light distillate liquids are also produced.

PB-233 278/1GA PC$18.75/MF$1.45
Pittsburg and Midway Coal Mining Co., Kansas City, Mo.
SOLVENT REFINED COAL (SRC) PROCESS.
Monthly rept. nos. 14 thru 27, Nov 67-Dec 68.
Dec 68, 314p
Contract DI-14-01-0001-496
See also Monthly rept. nos. 1-13, PB-233 277 and Monthly rept. nos. 28-39, PB-233 279.

Descriptors: *Coal preparation, *Hydrogenation, Pilot plants, Organic solvents, Ash content, Materials recovery, Ashes, Liquefaction.
Identifiers: *Solvent refining, Solvent refined coal.

These monthly reports trace the progress of the Solvent Refined Coal (SRC) process developed by the Pittsburg and Midway Coal Mining Co. under contract to the Office of Coal Research since 1966. The process will undergo testing in a pilot plant recently completed near Tacoma, Washington, at a cost of $18 million. In the SRC process, coal is first dissolved under moderate hydrogen pressure in a heavy aromatic solvent derived from the process. The resultant coal solution is filtered to remove ash and a small amount of insoluble organic material and fractionated to recover the solvent. The main product from the process is a heavy organic material called solvent refined coal. Smaller quantities of hydrocarbon gases and light distillate liquids are also produced.

PB-233 279/9GA PC$20.00/MF$1.45
Pittsburg and Midway Coal Mining Co., Kansas City, Mo.
SOLVENT REFINED COAL (SRC) PROCESS.
Monthly rept. nos. 28 thru 39, Jan-Dec 69.
Dec 69, 337p
Contract DI-14-01-0001-496
See also Monthly rept. nos. 14-27, PB-233 278 and Monthly rept. nos. 40-48, PB-233 280.

Descriptors: *Coal preparation, *Hydrogenation, Pilot plants, Organic solvents, Ash content, Materials recovery, Ashes, Liquefaction.
Identifiers: *Solvent refining, Solvent refined coal.

These monthly reports trace the progress of the Solvent Refined Coal (SRC) process developed by The Pittsburg and Midway Coal Mining Co. under contract to the Office of Coal Research since 1966. The process will undergo testing in a pilot plant recently completed near Tacoma, Washington, at a cost of $18 million. In the SRC process, coal is first dissolved under moderate hydrogen pressure in a heavy aromatic solvent derived from the process. The resultant coal solution is filtered to remove ash and a small amount of insoluble organic material and fractionated to recover the solvent. The main product from the process is a heavy organic material called solvent refined coal. Smaller quantities of hydrocarbon gases and light distillate liquids are also produced.

PB-233 280/7GA PC$20.25/MF$1.45
Pittsburg and Midway Coal Mining Co., Kansas City, Mo.
SOLVENT REFINED COAL (SRC) PROCESS.
Monthly rept. nos. 40 thru 48, Jan-Sep 70.
Sep 70, 341p
Contract DI-14-01-0001-496
See also Monthly rept. nos. 28-39, PB-233 279 and Monthly rept. nos. 49-55, PB-233 281.

Descriptors: *Coal preparation, *Hydrogenation, Pilot plants, Organic solvents, Ash content, Materials recovery, Ashes, Liquefaction.
Identifiers: *Solvent refining, Solvent refined coal.

These monthly reports trace the progress of the Solvent Refined Coal (SRC) process developed by The Pittsburg and Midway Coal Mining Co. under contract to the Office of Coal Research since 1966. The process will undergo testing in a pilot plant recently completed near Tacoma, Washington, at a cost of $18 million. In the SRC process, coal is first dissolved under moderate hydrogen pressure in a heavy aromatic solvent derived from the process. The resultant coal solution is filtered to remove ash and a small amount of insoluble organic material and fractionated to recover the solvent. The main product from the process is a heavy organic material called solvent refined coal. Smaller quantities of hydrocarbon gases and light distillate liquids are also produced.

PB-233 281/5GA PC$19.00/MF$1.45
Pittsburg and Midway Coal Mining Co., Kansas City, Mo.
SOLVENT REFINED COAL (SRC) PROCESS.
Monthly rept. nos. 49 thru 55, Oct 70-Apr 71.
Apr 71, 317p
Contract DI-14-01-0001-496
See also Monthly rept. nos. 40-48, PB-233 280 and Monthly rept. nos. 56-61, PB-233 282.

Descriptors: *Coal preparation, *Hydrogenation, Pilot plants, Organic solvents, Ash content, Materials recovery, Ashes, Liquefaction.
Identifiers: *Solvent refining, Solvent refined coal.

These monthly reports trace the progress of the Solvent Refined Coal (SRC) process developed by The Pittsburg and Midway Coal Mining Co. under contract to the Office of Coal Research since 1966. The process will undergo testing in a pilot plant recently completed near Tacoma, Washington, at a cost of $18 million. In the SRC process, coal is first dissolved under moderate hydrogen pressure in a heavy aromatic solvent derived from the process. The resultant coal solution is filtered to remove ash and a small amount of insoluble organic material and fractionated to recover the solvent. The main product from the process is a heavy organic material called solvent refined coal. Smaller quantities of hydrocarbon gases and light distillate liquids are also produced.

PB-233 282/3GA PC$19.00/MF$1.45
Pittsburg and Midway Coal Mining Co., Kansas City, Mo.
SOLVENT REFINED COAL (SRC) PROCESS.
Monthly rept. nos. 56-61, May 71-Oct 71.
Oct 71, 320p
Contract DI-14-01-0001-496
See also Monthly rept. nos. 49-55, PB-233 281 and Monthly rept. nos. 62-67, PB-233 283.

Descriptors: *Coal preparation, *Hydrogenation, Pilot plants, Organic solvents, Ash content, Materials recovery, Ashes, Liquefaction.
Identifiers: *Solvent refining, Solvent refined coal.

These monthly reports trace the progress of the Solvent Refined Coal (SRC) process developed by The Pittsburg and Midway Coal Mining Co. under contract to the Office of Coal Research since 1966. The process will undergo testing in a pilot plant recently completed near Tacoma, Washington, at a cost of $18 million. In the SRC process, coal is first dissolved under moderate hydrogen pressure in a heavy aromatic solvent derived from the process. The resultant coal solution is filtered to remove ash and a small amount of insoluble organic material and fractionated to recover the solvent. The main product from the process is a heavy organic material called solvent refined coal. Smaller quantities of hydrocarbon gases and light distillate liquids are also produced.

PB-233 283/1GA PC$20.00/MF$1.45
Pittsburg and Midway Coal Mining Co., Kansas City, Mo.
SOLVENT REFINED COAL (SRC) PROCESS.
Monthly rept. nos. 62 thru 67, Nov 71-Apr 72.
Apr 72, 340p
Contract DI-14-01-0001-496
See also Monthly rept. nos. 56-61, PB-233 282 and Monthly rept. nos. 68-74, PB-233 284.

Descriptors: *Coal preparation, *Hydrogenation, Pilot plants, Organic solvents, Ash content, Materials recovery, Ashes, Liquefaction.
Identifiers: *Solvent refining, Solvent refined coal.

These monthly reports trace the progress of the Solvent Refined Coal (SRC) process developed by The Pittsburg and Midway Coal Mining Co. under contract to the Office of Coal Research since 1966. The process will undergo testing in a pilot plant recently completed near Tacoma, Washington, at a cost of $18 million. In the SRC process, coal is first dissolved under moderate hydrogen pressure in a heavy aromatic solvent derived from the process. The resultant coal solution is filtered to remove ash and a small amount of insoluble organic material and fractionated to recover the solvent. The main product from the process is a heavy organic material called solvent refined coal. Smaller quantities of hydrocarbon gases and light distillate liquids are also produced.

PB-233 284/9GA PC$20.75/MF$1.45
Pittsburg and Midway Coal Mining Co., Kansas City, Mo.
SOLVENT REFINED COAL (SRC) PROCESS.
Monthly rept. nos. 68 thru 74.
Nov 72, 352p
Contract DI-14-01-0001-496
See also Monthly rept. nos. 62-67, PB-233 283 and Monthly rept. nos. 75-79, PB-233 285.

Descriptors: *Coal preparation, *Hydrogenation, Pilot plants, Organic solvents, Ash content, Materials recovery, Ashes, Liquefaction.
Identifiers: *Solvent refining, Solvent refined coal.

These monthly reports trace the process of the Solvent Refined Coal (SRC) process developed by The Pittsburg and Midway Coal Mining Co. under contract to the Office of Coal Research since 1966. The process will undergo testing in a pilot plant recently completed near Tacoma, Washington, at a cost of $18 million. In the SRC process, coal is first dissolved under moderate hydrogen pressure in a heavy aromatic solvent derived from the process. The resultant coal solution is filtered to remove ash and a small amount of insoluble organic material and fractionated to recover the solvent. The main product from the process is a heavy organic material called solvent refined coal. Smaller quantities of hydrocarbon gases and light distillate liquids are also produced.

PB-233 285/6GA PC$21.00/MF$1.45
Pittsburg and Midway Coal Mining Co., Kansas City, Mo.
SOLVENT REFINED COAL (SRC) PROCESS.
Monthly rept. nos. 75-79, Dec 72-Apr 73.
Apr 73, 358p
Contract DI-14-01-0001-496
See also Monthly rept. nos. 68-74, PB-233 284 and Monthly rept. nos. 80-83, PB-233 286.

Descriptors: *Coal preparation, *Hydrogenation, Pilot plants, Organic solvents, Ash content, Materials recovery, Ashes, Liquefaction.
Identifiers: *Solvent refining, Solvent refined coal.

These monthly reports trace the progress of the Solvent Refined Coal (SRC) process developed by The Pittsburg and Midway Coal Mining Co. under contract to the Office of Coal Research since 1966. The process will undergo testing in a pilot plant recently completed near Tacoma, Washington, at

a cost of $18 million. In the SRC process, coal is first dissolved under moderate hydrogen pressure in a heavy aromatic solvent derived from process. The resultant coal solution is filtered to remove ash and a small amount of insoluble organic material and fractionated to recover the solvent. The main product from the process is a heavy organic material called solvent refined coal. Smaller quantities of hydrocarbon gases and light distillate liquids are also produced.

PB-233 286/4GA PC$18.50/MF$1.45
Pittsburg and Midway Coal Mining Co., Kansas City, Mo.
SOLVENT REFINED COAL (SRC) PROCESS.
Monthly rept. nos. 80 thru 83, May-Aug 73.
Aug 73, 307p
Contract DI-14-01-0001-496
See also Monthly rept. nos. 75-79, PB-233 285 and Monthly rept. nos. 84-87, PB-233 287.

Descriptors: *Coal preparation, *Hydrogenation, Pilot plants, Organic solvents, Ash content, Materials recovery, Ashes, Liquefaction.
Identifiers: *Solvent refining, Solvent refined coal.

These monthly reports trace the progress of the Solvent Refined Coal (SRC) process developed by The Pittsburg and Midway Coal Mining Co. under contract to the Office of Coal Research since 1966. The process will undergo testing in a pilot plant recently completed near Tacoma, Washington, at a cost of $18 million. In the SRC process, coal is first dissolved under moderate hydrogen pressure in a heavy aromatic solvent derived from the process. The resultant coal solution is filtered to remove ash and a small amount of insoluble organic material and fractionated to recover the solvent. The main product from the process is a heavy organic material called solvent refined coal. Smaller quantities of hydrocarbon gases and light distillate liquids are also produced.

PB-233 287/2GA PC$15.25/MF$1.45
Pittsburg and Midway Coal Mining Co., Kansas City, Mo.
SOLVENT REFINED COAL (SRC) PROCESS.
Monthly rept. nos. 84 thru 87, Sep-Dec 73.
Dec 73, 245p
Contract DI-14-01-0001-496
See also Monthly rept. nos. 80-83, PB-233 286 and Monthly rept. nos. 88-90, PB-233 288.

Descriptors: *Coal preparation, *Hydrogenation, Pilot plants, Organic solvents, Ash content, Materials recovery, Ashes, Liquefaction.
Identifiers: *Solvent refining, Solvent refined coal.

These monthly reports trace the progress of the Solvent Refined Coal (SRC) process developed by The Pittsburg and Midway Coal Mining Co. under contract to the Office of Coal Research since 1966. The process will undergo testing in a pilot plant recently completed near Tacoma, Washington, at a cost of $18 million. In the SRC process, coal is first dissolved under moderate hydrogen pressure in a heavy aromatic solvent derived from the process. The resultant coal solution is filtered to remove ash and a small amount of insoluble organic material and fractionated to recover the solvent. The main product from the process is a heavy organic material called solvent refined coal. Smaller quantities of hydrocarbon gases and light distillate liquids are also produced.

PB-233 288/0GA PC$11.25/MF$1.45
Pittsburg and Midway Coal Mining Co., Kansas City, Mo.
SOLVENT REFINED COAL (SRC) PROCESS.
Monthly rept. nos. 88 thru 90, Jan-Mar 74.
Mar 74, 164p
Contract DI-14-01-0001-496
See also Monthly rept. nos. 84-87, PB-233 287.

Descriptors: *Coal preparation, *Hydrogenation, Pilot plants, Organic solvents, Ash content, Materials recovery, Ashes, Liquefaction.
Identifiers: *Solvent refining, Solvent refined coal.

These monthly reports trace the progress of the Solvent Refined Coal (SRC) process developed by The Pittsburg and Midway Coal mining Co. under contract to the Office of Coal Research since 1966. The process will undergo testing in a pilot plant recently completed near Tacoma, Washington, at a cost of $18 million. In the SRC process, coal is first dissolved under moderate hydrogen pressure in a heavy aromatic solvent derived from the process. The resultant coal solution is filtered to remove ash and a small amount of insoluble organic material and fractionated to recover the solvent. The main product from the process is a heavy organic material called solvent refined coal. Smaller quantities of hydrocarbon gases and light distillate liquids are also produced.

PB-233 396/1GA PC$13.25/MF$1.45
Bureau of Mines, Washington, D.C.
HYDROGENATION OF COAL AND TAR,
W. R. K. Wu, and H. H. Storch. 1968, 204p
BuMines-B-633

Descriptors: *Hydrogenation, *Coal, *Tars, *Synthetic oils, Liquefaction, Reviews, Process charting, Catalysts, Fuels, Design, History, Development, Gasoline, Equipment, Liquid phases, Vapor phases, Coal tar, Pitch(Material), Economic analysis.

This bulletin traces the development of high-pressure coal and tar hydrogenation technology, based on an intensive review of the pertinent literature. The bulletin was written as part of the Bureau of Mines research program on synthetic liquid fuels. It covers the history and economics of the process; the chemical aspect of hydrogenation of coal, tar, and middle oil; the engineering aspect of converting coal and tar to liquid fuels, principally gasoline; and the equipment for the process. The literature covered includes documents of the United States and British Governments, journals, and other publications. Bureau results in the hydrogenation field are also incorporated.

SLA-73-5805 PC$3.00/MF$1.45
Sandia Labs., Albuquerque, N.Mex. (Usa).
SURFACE ELECTRONIC PROPERTIES AND THE SEARCH FOR NEW HYDROGEN OXIDATION CATALYSTS.
G. E. Laramore, J. E. Houston, and R. L. Park. 1973, 10p CONF-740306-3

Descriptors: (*Hydrogen, *Oxidation), (*Tungsten, *Catalysts), (*Tungsten carbides, Catalysts), (*Platinum, Catalysts), Catalysis, Combustion, Electronic structure, Energy sources, Synthetic fuels.

For abstract, see NSA 30 01, number 02367.

7B. Inorganic Chemistry

AD-780 857/9GA PC$3.75/MF$1.45
Army Medical Bioengineering Research and Development Lab Aberdeen Proving Ground Md
DEVELOPMENT OF A RAPID SPECIFIC FREE AVAILABLE CHLORINE TEST WITH SYRINGALDAZINE (FACTS).
Final technical rept.,
Eugene P. Meter, William J. Cooper, and Charles A. Sorber. May 74, 52p Rept no. TR-7405

Descriptors: *Chlorine, *Colorimetric analysis, Sensitivity, Accuracy.
Identifiers: Water analysis, SNORT(Stabilized Neutral Orthotolidine Test), *Syringaldazine, Phenylenediamine/N-N-diethyl, Arsenites, Interference(Chelation), Stabilized neutral orthotolidine test.

Modifications to three test procedures for the determination of free available chlorine (FAC) have been attempted and/or evaluated. The three test procedures, selected as the result of previous studies, were the N,N-diethyl-p-phenylenediamine (DPD), the stabilized neutral orthotolidine (SNORT) procedure, and the syringaldazine (liquid) procedure. The syringaldazine (liquid) procedure was modified to produce a test (FACTS) which is accurate, precise and specific in the determination of FAC. This study showed that the FACTS procedure is not subject to interference from any of the common interferences in other FAC methods; is accurate and precise for determination of FAC; can be developed as a field test kit; and can be employed to determine combined available chlorine. (Modified author abstract)

AD-780 919/7GA PC$3.25/MF$1.45
Massachusetts Inst of Tech Cambridge Dept of Chemistry
SYNTHESIS OF INTERCALATION COMPOUNDS AND NEW INORGANIC FLUORINE COMPOUNDS.
Final rept. 1 Jan 72-31 Aug 73,
Richard J. Lagow, and James L. Adcock. May 74, 27p ECOM-0166-F-72
Contract DAAB07-72-C-0166

Descriptors: *Fluorination, *Fluorine compounds, Fluorides, Stability, Fluorohydrocarbons, Hydrocarbons, Polymers, Graphite, Boron nitrides, Solubility, Synthesis(Chemistry).
Identifiers: Graphite fluoride.

Various organic and inorganic fluorine containing compounds were prepared and characterized. Each of these compounds contained substrate-fluorine bonds of varying strength and activity. Boron nitride, graphitized carbon black, paracyanogen, pyrolized polyacrylonitrile, graphite oxide, a series of polynuclear hydrocarbons (including phthalocyanine, tetracene and decacyclene, coronene and tribenz(a, c, h) phenazine), polyacrylonitrile, and polypropylene were fluorinated and tested for solubility in propylene carbonate and stability. (Modified author abstract)

ANCR-1133 PC$5.45/MF$1.45
Aerojet Nuclear CO., Idaho Falls, Idaho (Usa).
X-RAY: AN ON-LINE PROGRAM FOR AUTOMATIC ELECTRON MICROANALYSIS OF OXIDES AND SILICATES USING A SI(LI) SPECTROMETER.
R. J. Gehrke, and R. C. Davies. Mar 74, 89p
Contract AT(10-1)-1375

Descriptors: (*Silicates, *Chemical analysis), (*Oxides, Chemical analysis), (*Computer codes, *X codes), Electron microscopy, Fortran, Hornblende, Quantitative chemical analysis, Trace amounts, X-ray spectroscopy.

For abstract, see NSA 30 01, number 02271.

PB-233 149/4GA PC$4.00/MF$1.45
Armageddon Chemical Co., Durham, N.C.
SYNTHESIS OF TRIFLUOROMETHYLSULFUR PENTAFLUORIDE (CF3SF5).
Environmental Monitoring series (Final) 24 Aug 72-12 Jan 74,
Edward A. Tyczkowski. Apr 74, 16p EPA-650/4-74-010
Contract EPA-68-02-0680

Descriptors: *Fluorination, Organic sulfides, Synthesis(Chemistry), Purification, Fluorine organic compounds.
Identifiers: Cobalt fluorides, *Sulfur fluorides, Sulfur/pentafluoro-trifluoromethyl.

A quantity of 100 lb. of CF3SF5 was prepared by the cobalt trifluoride fluorination of bis(trifluoromethyl)disulfide (CF3SSCF3). It was purified by alkaline sulfite scrubbing and fractional distillation to meet the quality requirements.

7C. Organic Chemistry

AD-780 715/9GA PC$3.00/MF$1.45
Defence Research Establishment Suffield Ralston (Alberta)
THE PREPARATION OF ALPHA-BUTYLAMINO AND OTHER AMINE FUNCTIONS OF STYRENE BEARING TWO OR THREE GROUPS ON THE TERMINAL (BETA) CARBON ATOM.
Technical note,
R. F. Silver. Mar 74, 21p Rept no. DRES-TN-346

Descriptors: *Benzenes, *Imines, Synthesis(Chemistry), Molecular structure, Canada.
Identifiers: *Benzylideneimines.

The synthetic routes to several beta-substituted N-butyl benzylideneimines are described.

AD-780 927/0GA PC$3.25/MF$1.45
California Univ Los Angeles Dept of Chemistry
SYNTHESIS OF 'NIDO-' AND 'CLOSO-'ARSACARBORANES,
Hampton D. Smith, Jr., and M. Frederick Hawthorne. 5 Jun 74, 27p Rept no. TR-67
Contract N00014-69-A-0200-4019

Descriptors: *Carboranes, *Arsenic compounds, Metalorganic compounds, Synthesis(Chemistry), Molecular structure, Infrared spectra, Nuclear magnetic resonance.
Identifiers: *Metallocarboranes, Nuclear magnetic resonance(Boron 11), Dicarbo-arsenio-dodecaborane(11)/dimethyl-dimethylarsino-nido, Dicarba-arsenio-dodecaborane(11)/phenyl-closo.

Reaction of Tl27,8-C2B9H11 with RAsX2(R = CH3, X = Br; R = C6H5, n-C4H9, X = Cl) in diethyl ether solution produced compounds characterized as 3-R-3-As-1,2-C2B9H11. Spectral data indicate closo-icosahedral structures for these species. Reaction of the synthesized compound with BBr3 afforded 3-Br-3-AS-1,2-C2B9H11. Reaction of (CH3)2AsBr with Tl2C2B9H11 in a 2:1 ratio afforded ((CH3)2As)2C2B9H11. Spectral and chemical data suggest a nido 12 vertex structure for this species with one (CH3)2As group terminally bonded to boron. (Author)

AD-781 030/2GA PC$4.75/MF$1.45
Army Foreign Science and Technology Center Charlottesville Va
OXIDATIVE CHLOROPHOSPHORYLATION OF HYDROCARBONS AND THEIR DERIVATIVES,
Yu. M. Zinovev, and I.. Z. Soborovskii. 7 Sep 73, 34p Rept no. FSTC-HT-23-58-74
Trans. of Reaktsii i Metody Issledovaniya Organicheskikh Soedinenii (USSR) n21 p6-40 1970.

Descriptors: *Phosphorylation, *Oxidation, *Aliphatic compounds, Phosphonic acids, Synthesis(Chemistry), Chlorides, Hydrocarbons, USSR, Translations, Alkanes, Alkenes.
Identifiers: *Acid halides, Chemical reaction mechanisms, Phosphorus chlorides.

Oxidative chlorophosphorylation of hydrocarbons and their derivatives with phosphorus trichloride and oxygen yields acid chlorides that serve as starting compounds for the preparation of various organophosphorus compounds. Various paraffin and monomeric olefin hydrocarbons were used as the basis for the preparation of acid chlorides reviewed. Reaction mechanisms proposed for oxidative chlorophosphorylation are compared and examples of preparative procedures are set forth.

AD-781 054/2GA Not available NTIS
National Research Council of Canada Halifax (Nova Scotia) Atlantic Regional Lab
SUBSTITUENT AND H/D RANDOMIZATION IN THE MASS SPECTRA OF SUBSTITUTED DIPHENYLACETYLENIC COMPOUNDS,
S. Safe. 6 Apr 73, 11p NRC-12354
Revision of report dated 18 Jan 73.
Availability: Pub. in Jnl. of Organic Mass spectrometry, v7 p1329-1336 1973.

Descriptors: *Alkynes, *Mass spectra, Amines, Deuterium compounds, Chemical bonds, Halogenated hydrocarbons, Aromatic compounds, Electron irradiation, Fragmentation, Canada.
Identifiers: Acetylenes/diphenyl, Electron molecule interactions, Nitro compounds, *Rearrangement reactions.

The mass spectra of several substituted diphenylacetylenes are reported and the (metastable ion)/(daughter ion) ratios for the isomeric chloro- and bromodiphenylacetylenes suggested substituent scrambling in their respective molecular ions. The fragmentation patterns for the amino- and nitrodiphenylacetylenes differed somewhat from most other aromatic amino and nitro compounds. The mass spectra of several deuterated substituted diphenylacetylenes clearly showed extensive (but not complete) H/D equilibration in the molecular ion or some subsequent decomposition ion. (Modified author abstract)

AD-781 084/9GA Reprint
Massachusetts Inst of Tech Cambridge Dept of Chemistry
HALOMETHYL-METAL COMPOUNDS. LXVII. THE APPLICATION OF PHENYL(TRIHALOMETHYL)MERCURY COMPOUNDS IN THE SYNTHESIS OF HIGHLY HALOGENATED OXIRANES,
Dietmar Seyferth, Wolfgang Tronich, William E. Smith, and Steven P. Hopper. 7 Aug 73, 15p AFOSR-TR-74-0893
Grant AF-AFOSR-2204-72
See also Part 65, AD-774 381.
Availability: Pub. in Jnl. of Organometallic Chemistry, v67 p341-352 1974.

Descriptors: *Epoxy compounds, *Addition reactions, *Carbenes, Molecular structure, Ethylene oxide, Synthesis(Chemistry), Halogen compounds, Halogenated hydrocarbons, Mercury compounds, Infrared spectra, Mass spectra, Ketones.
Identifiers: Mercury organic compounds, Chemical reaction mechanisms.

Phenyl(trihalomethyl)mercury compounds react with highly halogenated ketones, aldehydes, and acid chlorides to add CX2 to the C=O bond, giving oxiranes. In the case of hexachloroacetone and n-C3F7OCF(CF3)CF2OCF(CF3)C(O)F, ketones were obtained instead. In the reactions with the acid chlorides, ketones also were formed in addition to the oxiranes. Reaction of PhHgCCl2Br with oxalyl chloride produced the expected oxirane, 2,3,3-trichloro-2,3-epoxypropenoyl chloride, as well as trichloropyruvyl chloride, trichloroacetyl chloride and hexachlorobiacetyl. A reaction of this mercury reagent with benzil gave PhC(O)-CClPh-C(O)Cl, most likely via rearrangement of the initially formed oxirane. (Modified author abstract)

AD-781 087/2GA Reprint
University of Southern California Los Angeles Dept of Chemistry
REACTION OF 1,2-GLYCOLS WITH DICHLOROCARBENE PRODUCED BY PHASE TRANSFER CATALYSIS,
P. Stromquist, Michele Radcliffe, and William P. Weber. 6 Aug 73, 6p AFOSR-TR-74-0921
Grant AF-AFOSR-2424-73
Availability: Pub. in Tetrahedron Letters n45 p4523-4526 1973.

Descriptors: *Glycols, *Carbenes, *Chemical reactions, Molecular structure, Stereochemistry.
Identifiers: Chemical reaction mechanisms, Methylene carbene/dichloro.

The reaction of 1,2-glycols with dichlorocarbene leads to deoxygenated products. These results can be rationalized if the alkoxychlorocarbene intermediate has a sufficient lifetime to be trapped by an internal alkoxide nucleophile prior to its ionization to a carbonium ion. (Author)

AD-781 096/3GA Reprint
Pennsylvania State Univ University Park Dept of Chemistry
REACTIONS OF MOLYBDENUM AND TUNGSTEN ATOMS. SYNTHESIS OF BISARENE SANDWICH COMPOUNDS,
M. P. Silvon, E. M. Van Dam, and P. S. Skell. 15 Dec 73, 3p AFOSR-TR-74-0923
Grant AF-AFOSR-1983-71
Availability: Pub. in Jnl. of the American Chemical Society, v96 p1945 1974.

Descriptors: *Metalorganic compounds, *Molybdenum compounds, *Tungsten compounds, Nuclear magnetic resonance, Benzenes, Toluenes, Xylenes.
Identifiers: Molybdenum organic compounds, Tungsten organic compounds, Anisole.

Benzene sandwich compounds of molybdenum and tungsten are reported. The mass spectra (with expected isotope patterns) and proton magnetic resonance spectra serve to identify these products.

AD-781 097/1GA Reprint
Pennsylvania State Univ University Park Dept of Chemistry
REACTIONS OF TUNGSTEN AND MOLYBDENUM ATOMS WITH 1,3-BUTADIENE. TRIS(BUTADIENE)TUNGSTEN AND -MOLYBDENUM,
P. S. Skell, E. M. Van Dam, and M. P. Silvon. 17 Nov 73, 3p AFOSR-TR-74-0951
Grant AF-AFOSR-1983-71
Availability: Pub. in Jnl. of the American Chemical Society, v96 n2 p926, 23 Jan 74.

Descriptors: *Tungsten, *Molybdenum, *Butadienes, *Metal complexes, Ligands, Chemical reactions, Metalorganic compounds, Synthesis(Chemistry), Nuclear magnetic resonance, Infrared spectra.
Identifiers: Tungsten/tris(butadiene), Molybdenum/tris(butadiene).

In studying the reactions of atomic tungsten and atomic molybdenum in the condensed phase, the authors have found that they react readily with a variety of olefinic and aromatic reagents. The authors report here the adducts with 1,3-butadiene. The products are tris(butadiene)tungsten and tris(butadiene)molybdenum. (Modified author abstract)

INP-847 PC$4.25/MF$1.45
Institute of Nuclear Physics, Krakow (Poland).
ABSORPTION SPECTRA OF P-METHOXY BENZYLIDENE P-N-BUTYLANILINE IN 80 TO 400 CM EXP -1 RANGE AT TEMPERATURES BETWEEN -200 AND +70 EXP 0 C.
E. Sciesinska, J. Sciesinski, J. Twardowski, and J. A. Janik. Sep 73, 24p

Descriptors: (*Amines, *Absorption spectra), Crystal structure, Infrared radiation, Low temperature, Medium temperature, Organic oxygen compounds, Phase transformations, Stability.

For abstract, see NSA 30 01, number 02278.

PATENT-3 193 409 Not available NTIS
Department of Agriculture, Washington, D.C.
ALKALI-STABLE THIN-BOILING STARCHES AND METHOD OF MAKING SAME.
Patent.
Wilbur C. Schaefer, and Charles R. Russell. Filed 16 Jan 63, patented 6 Jul 65, 3p PAT-APPL-251 984,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Starches, Viscosity, Granular materials, Corrosion resistance, Alkalies, Stability, Synthesis(Chemistry).
Identifiers: PAT-CL-127-33.

The invention relates to a method of producing granular starches that readily gelatinize in hot water to provide alkali-stable thin-boiling starches.

PATENT-3 226 406 Not available NTIS
Department of Agriculture, Washington, D.C.
WAX ESTER SUBSTITUTE FOR JOJOBA OIL FROM THE SEED OF LIMNATHES DOUGLASII.
Patent,
Thomas K. Miwa, and Ivan A. Wolff. Filed 3 Jan 63, patented 28 Dec 65, 2p PAT-APPL-249 300,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Waxes, *Vegetable oils, Acyclic alcohols, Synthesis(Chemistry), Hydrogenation, Fatty acids, Esterification.
Identifiers: PAT-CL-260-410-9, Jojoba oil, Limnanthes douglasii.

The invention relates to the preparation of a liquid wax ester and the corresponding hydrogenated solid wax ester, the properties of which respective forms are practically indistinguishable from those of the natural liquid ester wax obtained as the 'oil' present in the need of Simmondsia chinensis (jojoba) and the solid wax obtained by hydrogenating jojoba oil. The authors extracted the triglyceride oils from ground seed of Limnanthes douglasii (meadowfoam), and prepared its fatty alcohols and acids, and the liquid wax ester product.

PATENT-3 258 475 Not available NTIS
Department of Agriculture, Washington, D.C.
FILM-FORMING ORGANOMETALLIC DERIVATIVES OF FATTY ACIDS.
Patent,
Raymond Noel Faulkner, and Leonard Alfred O'Neill. Filed 13 Aug 63, patented 28 Jun 66, 7p PAT-APPL-302 493,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Chelates, *Fatty acids, *Coatings, *Organometallic compounds, Copper organic compounds, Titanium organic compounds, Aluminum organic compounds, Synthesis(Chemistry), Chelating agents, Alcoholates, Chelation.
Identifiers: PAT-CL-260-414, Metal complexes.

The invention relates to novel film-forming organometallic materials. More particularly, this invention relates to novel derivatives of alkoxides of such metals as aluminum, titanium, and copper, which are reacted with the esters of the alcohols derived from the polyunsaturated vegetable oil fatty acids with acetoacetic acid or with the acetylacetonates of the said metals to thereby provide novel chelate complexes. Xylene or toluene solutions of the chelates have adequate storage stability to gelation and may be applied as coating compositions to metal surfaces. They provide cured films that demonstrate selectively modified properties perhaps by in situ chelation therewith by carboxyl or hydroxyl groups of the coating complex.

PATENT-3 287 326 Not available NTIS
Department of Agriculture, Washington, D.C.
GLYCEROL DERIVATIVES OF AZELAALDEHYDIC ACID AND POLY(ESTER-ACETALS) THEREFROM.
Patent,
William R. Miller, John C. Cowan, and Everett H. Pryde. Filed 11 Aug 65, patented 22 Nov 66, 7p PAT-APPL-485 668,
Previously filed as PAT-APPL-305 556, 29 Aug 63. Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Polyester resins, *Acetals, *Glycerides, Aliphatic acid esters, Synthesis(Chemistry), Acetal resins, Polymerization, Hydrolysis.
Identifiers: PAT-CL-260-78-3, Azelaaldehydates.

The invention relates to glyceryl acetals of methylazelaaldehydate which can be directly polymerized to novel poly(ester-acetals). Glyceryl ester-acetals, under mild hydrolysis conditions form free glyceryl-ester-aldehyde molecules that homopolymerize to form rather low molecular weight, poly(ester-acetal) prepolymers that can be further polymerized to provide novel polyesters having utility as film-formers and for the preparation of fibers and coatings.

PATENT-3 294 781 Not available NTIS
Department of Agriculture, Washington, D.C.
CARBOHYDRATE ALIPHATIC AND CYCLIC ACETALS.
Patent,
Mary Ollidene Weaver, and Charles R. Russell. Filed 11 Jun 63, patented 27 Dec 66, 4p PAT-APPL-287 155,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Acetals, *Carbohydrates, Vinyl ethers, Polysaccharides, Monosaccharides, Synthesis(Chemistry).
Identifiers: PAT-CL-260-233-3.

The invention relates to novel products formed by the reaction of a carbohydrate and a vinyl ether. A wide diversity of acetals are obtained by reaction of a dimethyl sulfoxide dispersed carbohydrate such as starch, amylose, and glucose with a cyclic vinyl ether such as 3,4-dihydro-2H-pyran or with a short chain to long chain (fatty) saturated or unsaturated aliphatic vinyl ether. The selection of any particular vinyl ether reactant and the degree of substitution is largely controlled by the end use and the need for hydrophilic or for hydrophobic properties.

PATENT-3 414 530 Not available NTIS
Department of Agriculture, Washington, D.C.
GRAFT POLYMERS OF POLYALKYLENE OXIDES ON STARCH AND DEXTRIN.
Patent, *Filed 24 Feb 66, patented 3 Dec 68,
Albert Zilkha, MenasheTahan, and Gabriel Ezra. 3 Dec 68, 6p PAT-APPL-529 669,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Graft polymerization, Starch, Polysaccharides, Dextrins, Adhesives, Emulsifiers, Thickeners.
Identifiers: PAT-CL-260-9.

The present invention relates to an anionic polymerization process for the preparation of novel grafted copolymers of one or more polyalkylene oxides with polysaccharides, e.g., starches, dextrins, amylose, and amylopectin, the polyalkylene oxides being those formed during the grafting reaction from monomeric aliphatic or aromatic alkylene oxides or dialkylene oxides having from 2 to 10 carbon atoms. These graft copolymers of polyalkylene oxides on starch and dextrin polysaccharides having utility as adhesives, emulsifiers and thickeners are prepared by reacting under aprotic conditions the alkali metal alkoxide derivative of the polysaccharide with one or more of the alkylene oxides.

PATENT-3 491 040 Not available NTIS
Department of Agriculture, Washington, D.C.
PROCESS FOR ISOLATING VINYL-TYPE COMPONENT OF STARCH GRAFT COPOLYMERS.
Patent,
Lewis A. Gugliemelli, and M. Ollidene Weaver. Filed 14 Jun 68, patented 20 Jan 70, 2p PAT-APPL-736 966,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Vinyl copolymers, *Starches, *Depolymerization, Chemical analysis, Vinyl resins, Catalysis, Oxidation.
Identifiers: PAT-CL-260-17-4.

The patent describes a method for isolating vinyl-type compounds in starch graft copolymers under conditions that do not alter sensitive functional groups. The starch moiety is oxidized with periodate and the so produced dialdehyde starch moiety is then catalytically depolymerized at room temperature with sodium methoxide in anhydrous methanol. The liberated undepolymerized vinyl component is then readily and essentially quantitatively isolated for weighing and other analytical procedures.

PATENT-3 536 630 Not available NTIS
Department of Agriculture, Washington, D.C.
CALCIUM SEQUESTRATION IN HIGHLY ALKALINE MEDIUM.
Patent,
Charles L. Mehltretter. Filed 21 May 68, patented 27 Oct 70, 2p PAT-APPL-730 913,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Chelating agents, *Calcium, Polybasic organic acids, Alkalinity, Organic salts.
Identifiers: Propanetricarboxylic acid/dihydroxy-(trisodium-salt), PAT-CL-252-156.

The patent describes remarkably improved sequestrations of calcium ions in a distinctly alkaline medium, as in the washing of milk bottles, which are obtained where the sequestering agent is the known trisodium salt of dihydroxytricarballylic acid.

PATENT-3 542 821 Not available NTIS
Department of Agriculture, Washington, D.C.
CIS-RETAINING SELECTIVE HYDROGENATION OF VEGETABLE OILS.
Patent, *Filed 30 Aug 68, patented 24 Nov 70,
Edwin N. Frankel. 24 Nov 70, 5p PAT-APPL-756 423,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Catalysts, *Hydrogenation, *Linoleates, *Linolenates, Chromium organic compounds, Molecular isomervism, Vegetable oils, Soybean oil, Safflower oil, Stereochemistry.
Identifiers: PAT-CL-260-409, *Chromium carbonyls, Metal complexes.

The patent describes the action of arene chromium carbonyl complexes which under specified conditions very selectively catalyze the hydrogenation of only the linolenate and linoleate constituents of vegetable oils or their methyl esters without also catalyzing the reduction of the oleate to stearate. Most importantly, the catalysts provide extraordinarily limited extents of double bond isomerization, and are unique in their ability to retain or direct the resulting residual ethylenically unsaturated carbon atoms almost exclusively in the original type cis configuration, thus permitting the production from soybean or safflower oils of stable salad oils in which the virtual absence of trans double bonds and a practically unchanged stearate content enable the nonwinterized oils to be refrigerated without clouding.

PATENT-3 558 501 Not available NTIS
Department of Agriculture, Washington, D.C.
PROCESS FOR THE CHLOROHYDRINATION OF ALLYTRIMETHYLAMMONIUM CHLORIDE.
Patent, *Filed 1 May 69, patented 26 Jan 71,
Thomas A. McGuire, and Charles I. Mehltretter.
26 Jan 71, 3p PAT-APPL-820 754,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Quaternary ammonium salts, Addition reactions, Synthesis(Chemistry), Polysaccharides.
Identifiers: PAT-CL-252-182, Ammonium chloride/(chloro-hydroxy)propyl-trimethyl, Ammonium chloride/allyl-trimethyl, Hypochlorous acid.

The patent describes the reaction of allyltrimethylammonium chloride with hypochlorous acid in aqueous solution at 25 to 32C. which yields a mixture of monochlorohydroxypropyltrimethylammonium chlorides in nearly quantitative yiels. There is essentially no formation of dichloropropyltrimethylammonium chloride. The product is of value for reaction with starch and cellulose to produce industrial cationic polysaccharides.

PATENT-3 607 072 Not available NTIS
Department of Agriculture, Washington, D.C.
NOVEL CYSTEINE DERIVATIVE.
Patent, *Filed 21 Jan 70, patented 21 Sep 71,
Mendel Friedman, and James F. Cavins. 21 Sep 71, 2p PAT-APPL-8 112,
Previously filed as PAT-APPL-758 151, 6 Sep 68.
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D. C. 20231 $0.50.

Descriptors: *Alpha amino carboxylic acids, *Patents, Chromatographic analysis, Synthesis(Chemistry), Cysteine, Stability, Pyridines, Standards.
Identifiers: PAT-CL-23-230-R, *Alanine/(pyridylethyl)thio.

The patent concerns S-beta-(4-pyridylethyl)-L-cysteine, a novel amino acid produced by reacting L-cysteine and 4-vinylpyridine in the presence of triethylamine. It is ninhydrin-positive and very highly resistant to acid hydrolysis. It is particularly useful as an internal standard for chromotographic analyses of basic amino acids.

PATENT-3 792 017 Not available NTIS
Department of the Air Force Washington D C
THERMALLY STABLE QUINOXALINE POLYMERS AND METHOD OF SYNTHESIS.
Patent,
Fred E. Arnold, Frederick L. Hedberg, and Robert F. Kovar. Filed 19 Oct 72, patented 12 Feb 74, 5p Rept nos. PAT-APPL-298 975,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Heat resistant plastics, Phase transformations, Synthesis(Chemistry), Thermal stability, Adhesives, Nitrogen heterocyclic compounds, Molecular structure.
Identifiers: *Polyquinoxalines, PAT-CL-260-47-R.

In the patent thermally stable quinoxaline polymers are prepared by solution polycondensation of certain aromatic heterocyclic fused tetraamines with aromatic dibenzils. The high thermal stability, the high glass transition temperature, or the lack of such a temperature, and the solubility of the polymers in aprotic solvents render them especially useful as adhesives and in high temperature applications such as in the fabrication of plastic composites and protective coatings.

PATENT-3 803 086 Not available NTIS
Department of the Air Force Washington D C
VINYL-SUBSTITUTED SILOXANE AND SILOXAZANE POLYMERS.
Patent,
Laurence W. Breed, and James C. Wiley, Jr. Filed 5 Feb 73, patented 9 Apr 74, 5p Rept nos. PAT-APPL-329 509,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Elastomers, *Silicones, Synthesis(Chemistry), Heterocyclic compounds, Polymerization, Thermal stability, Crosslinking(Chemistry), Nitrogen heterocyclic compounds, Protective coatings.
Identifiers: Vinyl compounds, Silanes, PAT-CL-260-46-5-E.

The invention relates to siloxane and siloxazane polymers which contain vinyl groups. Polymer compositions are prepared by the polycondensation of an arylenedisilanol, a cyclic siloxazane compound or an N,N'-aminosilyl derivative thereof, and a vinyl-substituted arylenedisilanol. The polymer products are elastomeric and can be readily cured with conventional peroxide curing agents. Furthermore, the rubbery polymers exhibit a high degree of thermal stability and possess outstanding physical properties. The products can be formed into films, thereby rendering them particularly useful as protective coatings.

PB-232 858-T/GA PC$4.00/MF$1.45
National Institutes of Health, Bethesda, Md. Translation Unit.
SYNTHESIS OF 2, 3, 7, 8-TETRAMETHYLDIBENZOFURAN.
I. V. Mazere, I. A. Meirovits, V. A. Ozolina, and O. Ya.Neiland. Jun 74, 8p NIH-74-351C
Trans. of Khimiya Geterotsiklicheskikh Soedinenii (USSR) v12 p1597-1599 1972.

Descriptors: *Furans, Oxygen heterocyclic compounds, Ultraviolet spectra, Molecular structure, Synthesis(Chemistry), USSR, Translations.
Identifiers: *Dibenzofuran/tetramethyl.

3,4,3',4'-tetramethyldiphenyl oxide, upon bromination and iodination, easily forms 2,2'-dihalogen derivatives. Upon heating 2,2'-diiodo-4,5,4',5'-tetramethyldiphenyl oxide with copper powder or by oxidation of 2,2'-dilithium-4,5,4',5'-tetramethyldiphenyl oxide, 2,3,7,8-tetramethyldibenzofuran is formed, the structure of which was proved by countersynthesis. (Modified author abstract)

SLA-73-1094 PC$4.00/MF$1.45
Sandia Labs., Albuquerque, N.Mex. (Usa).
ORGANIC HYDROGEN GETTERS. PART II. PREPARATION AND PROPERTIES OF PHENYL PROPARGYL ETHER AND 1,6-DIPHENOXY-2,4-HEXADIYNE (DPPE).
R. L. Courtney. Feb 74, 13p
Contract AT(29-1)-789

Descriptors: (*Getters, *Hydrogen compounds), Calorimeters, Chemical preparation, Hydrogen, Infrared spectra, Organic compounds, Raman effect, Stability, Thermal gravimetric analysis, Thermal testing.

For abstract, see NSA 30 01, number 02287.

7D. Physical Chemistry

AD-780 547/6GA PC$3.25/MF$1.45
Aerospace Corp El Segundo Calif Lab Operations
VIBRATIONAL DEACTIVATION OF H2(V = 1) BY H-ATOMS.
Interim rept.,
Roger L. Wilkins. 29 Mar 74, 26p Rept no. TR-0074(4240-40)-2 SAMSO-TR-74-108
Contract F04701-73-C-0074

Descriptors: *Hydrogen, Molecular energy levels, Trajectories, Computations, Quenching(Inhibition), Relaxation, Reaction kinetics, Molecular vibration, Particle collisions, Potential energy.
Identifiers: Hydrogen atoms, Atom molecule interactions, Reaction rates, *Molecular relaxation.

Rate constants are calculated for the vibrational relaxation of H2(v = 1) by H-atoms. A classical three-dimensional trajectory calculation is carried out to determine if both reactive and nonreactive collisions play an important role in the dynamics of this reaction on a London-Eyring-Polanyi-Sato (LEPS) potential energy hypersurface. The results of this calculation are compared with available experimental data. (Author)

AD-780 560/9GA PC$3.00/MF$1.45
Aerochem Research Labs Inc Princeton N J
ALUMINUM OXIDE KINETICS.
Semiannual technical rept. 25 Jun 73-28 Feb 74,
Arthur Fontijn, and William Felder. May 74, 23p Rept no. AeroChem-TP-307 RADC-TR-74-158
Contract F30602-73-C-0339, ARPA Order-1649

Descriptors: *Oxidation, Resonance, Fluorescence, Reaction kinetics, Alumina.
Identifiers: *Aluminum oxide, Laser induced fluorescence, Chemical reactors.

The present work provides kinetic information on Al oxide reactions. To measure such kinetics the authors have modified the AeroChem high-temperature fast-flow reactor to allow direct observation of AlO by laser induced resonance fluorescence. They report here on the experimental methods and on their first observations on the reaction AlO + O2 to AlO2 + O. Rate coefficients are obtained from the observed variations in the relative AlO concentration as a function of reaction time, (O2) and total pressure at each of several temperatures.

AD-780 561/7GA PC$3.25/MF$1.45
Aerodyne Research Inc Burlington Mass
AN ANALYSIS OF THE VISIBLE CHEMILUMINESCENCE OBSERVED IN THE GAS-PHASE OXIDATION OF ALUMINUM AND ITS COMPOUNDS.
Final technical rept. Jul 73-Jan 74,
C. E. Kolb, D. R. Herschbach, and M. E. Gersh. Apr 74, 45p Rept no. ARI-RR-44 RADC-TR-74-163
Contract F30602-73-C-0162, ARPA Order-1649

Descriptors: *Chemiluminescence, *Oxidation, *Aluminum, Electron transitions, Upper atmosphere, Aluminum compounds, Molecular energy levels, Alumina.
Identifiers: *Aluminum oxide, Chemical reaction mechanisms.

A mechanism based on the population of and emission from the (A doublet Pi) and/or lowest-lying quartet sigma(+) and quartet Pi states of AlO is suggested as an explanation for the visible chemiluminescence often observed in the gas-phase oxidation of aluminum. Data from upper atmospheric chemical release experiments utilizing aluminized grenades, aluminized burners, and trimethylaluminum are examined, and AlO(*) pumping steps based on the reaction of molecules containing loosely bound aluminum atoms with atomic oxygen are suggested. Previously proposed theories are shown to be unable to reproduce reasonably the observed data. The results of selected, recent laboratory experiments involving chemiluminescent reactions of metal atoms and dimers with electrophilic atoms and molecules are discussed in terms of the proposed mechanism. Several possible experiments to test the proposed mechanism are suggested. (Author)

AD-780 656/5GA Reprint
Frankford Arsenal Philadelphia Pa
INFRARED SPECTRA AND INTERMOLECULAR POTENTIALS OF MATRIX ISOLATED

METHYL NITRATE AND METHYL-D3-NITRATE,
J. A. Lannon, W. G. Thomas, F. D. Verderame, L. E. Harris, and E. A. Lucia. 25 May 73, 17p Rept no. FA-A74-8
Availability: Pub. in Jnl. of Molecular Spectroscopy, v50 p68-81 1974.

Descriptors: *Infrared spectra, Molecules, Molecular energy levels, Spectrum analysis, Deuterium compounds, Nitrates, Ground state, Potential energy, Interactions, Molecular vibration, Geometry, Dimers.
Identifiers: Molecule molecule interactions, *Methyl nitrates, Matrix isolation techniques, Intermolecular potential.

The infrared spectra of protonated and deuterated methyl nitrate isolated in a nitrogen matrix have been recorded from 4000 to 250/cm. Peaks have been assigned to monomers, pairs, and higher-ordered species by varying the concentration of methyl nitrate in the matrix and also by inducing diffusion of molecules in the matrix. Monomer frequencies were used to calculate the normal coordinates, force constants, and cartesian displacements. Configurations of a pair of methyl nitrate molecules were calculated using an approximate nonbonded atom-atom potential including both Lennard-Jones and electrostatic potentials. The position of minimum energy was established as a function of the distance between molecules as well as angular rotation of the two molecules with respect to one another. Calculations of exciton splittings and shifts for the pair configuration computed to be most stable were evaluated by two site excition theory and compared to the assigned pair frequencies. (Author)

AD-780 727/4GA PC$3.25/MF$1.45
Harry Diamond Labs Washington D C
A REINTERPRETATION OF THE (SUP 3)H(SUB 6) AND (SUP 3)H(SUB 5) MULTIPLETS OF TM(3+):YVO4.
Technical rept.,
Nick Karayianis. Apr 74, 21p Rept no. HDL-TR-1661

Descriptors: *Thulium, Data processing, Symmetry, Spectrum analysis, Atomic energy levels, Vanadates, Yttrium compounds.
Identifiers: *Crystal fields, Yttrium vanadates.

Attempts are made to reassign symmetries to the (sup 3)H(sub 6) and (sup 3)H(sub 5) levels of Tm(3+):YVO4 reported by Knoll in order to obtain a better fit between theory and experiment. Based essentially on Knoll's assignments, Wortman, Leavitt and Morrison have made an elaborate analysis of the full f12 configuration, but could obtain a fit to only 14/cm. The present analysis does not improve on the results of Wortman et al, indicating that further experimental data are needed. (Author)

AD-780 731/6GA PC$3.75/MF$1.45
Environmental Research Inst of Michigan Ann Arbor
POLARIZED RADIANCE. VOLUME II. POLARIZED SPECTRAL EMITTANCE FROM 4 TO 14 MICROMETERS.
Final rept. 10 Apr-31 Dec 72,
J. R. Maxwell, R. Vincent, and S. Weiner. May 74, 67p Rept no. ERIM-192500-1-T(II) BRL-CR-155
Contract DAAD05-72-C-0246

Descriptors: *Polarization, *Surfaces, *Emission spectra, *Paints, Angles, Infrared radiation, Computer programs, Computerized simulation, Reflectivity, Emittance, Documents, Target discrimination.

Volume II of this report provides a description of a model for predicting emission polarization from paints. The report includes a description of measurements that were made along with graphs of measurement data. Validation of the model shows that model predictions agree with measurement to within the measurement accuracy 70% of the time, thus allowing degree of polarization to be calculated for smooth-surfaced materials in the thermal IR region for any wavelength (from about 7 to 15 micrometers) and any polar angle, with only a measurement of spectral emittance from 7 to 15 micrometers at any near-normal incidence required. A listing of model parameters appropriate to the sample paints supplied is included along with a document explaining the use of the computer programs and listings of the programs as well. (Modified author abstract)

AD-780 788/6GA PC$3.00/MF$1.45
Naval Ammunition Depot Crane Ind
SPECTROSCOPIC ANALYSIS OF AZIDE DECOMPOSITION PRODUCTS FOR USE IN A PYROTECHNICALLY INITIATED CARBON DIOXIDE CHEMICAL LASER,
Carl E. Dinerman. 10 May 74, 23p Rept no. NAD-CR-RDTR-269

Descriptors: *Sodium azides, *Pyrolysis, *Nitrogen, *Carbon dioxide lasers, Pyrotechnics, Excitation, Molecular vibration, Molecular energy levels, Ultraviolet spectra, Spectrum analysis, Absorption spectra.
Identifiers: Pyrotechnic lasers.

In the consideration of Sodium azide as a potential nitrogen source for a nitrogen-carbon dioxide chemical laser, it is important to know the fraction of the heat of decomposition of the azide that will appear as vibrational excitation in the nitrogen. To this end, the progressions of the Lyman-Birge-Hopfield bands of nitrogen were monitored by means of absorption spectroscopy in the vacuum ultraviolet, upon thermal decomposition of sodium azide. The experimental system is described and results to date are discussed. (Modified author abstract)

AD-780 832/2GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
SPECTROSCOPY OF THE VAPORS OF COMPOUNDS WITH LOW VOLATILITY SUPERCOOLED IN A SUPERSONIC FLOW,
D. I. Kataev, and A. A. Maltsev. 30 Apr 74, 21p Rept no. FTD-HT-23-783-74
Edited trans. of Zhurnal Eksperimentalnoi i Teoreticheskoi Fiziki (USSR) v64 n5 p1527-1537 May 73, by Marilyn Olaechea.

Descriptors: *Supercooling, *Vapors, *Supersonic flow, Molecular spectroscopy, USSR, Translations.

For molecular spectroscopy and related methods of studying molecule structure, including the development of gasdynamic lasers, a problem of immediate importance is that of obtaining the vapors of compounds with low volatility in the gas phase at translational and rotational temperatures close to absolute zero and at densities sufficient for spectrum registration. It has been shown that conditions for such great supercooling can be created in a supersonic flow. Three systems are examined. In the first of these supercooling is produced in a supersonic flow of pure vapors from a furnace or a shock tube. The second system differs from the first in that the vapors are mixed with an inert gas. In the third system the vapors are diffused into the boundary layer of a supersonic flow of cold inert gas through the porous furnace wall which is parallel to the flow.

AD-780 916/3GA PC$3.75/MF$1.45
Purdue Univ Lafayette Ind Project Squid Headquarters
SYMMETRY BREAKING INSTABILITIES IN ILLUMINATED SYSTEMS.
Technical rept.,
Abraham Nitzan, Peter Ortoleva, and John Ross. Jan 74, 57p Rept no. SQUID-TR-MIT-79-PU
Contract N00014-67-A-0226-0005
Prepared in cooperation with Massachusetts Inst. of Tech., Cambridge.

Descriptors: *Chemical equilibrium, *Illumination, Emission, Absorption(Physical), Acoustic emissions, Instability, Chemical reactions, Reaction kinetics, Acoustic waves, Thermodynamics, Optical properties, Relaxation, Transport properties, Nonlinear systems.
Identifiers: Squid project, Symmetry breaking.

Chemically non-reactive and reactive systems (closed and homogeneous) are shown to become unstable to inhomogeneous perturbations beyond given critical intensities of uniform illumination, so that macroscopic inhomogeneities, spatial patterns, arise. The authors classify symmetry-breaking instabilities into two types, one in which the characteristic length of the developing spatial pattern is determined by the dimensions of the system, and the other in which that characteristic length is determined by the dynamics of the system (reaction rates and transport relations). A variety of non-linear systems are analyzed by means of a linear stability analysis, including an illuminated, isothermal, isobaric, two species system, and a two-component non-reactive illuminated gaseous system in which diffusion, thermal conduction and thermal diffusion may occur. Pressure fluctuations are considered in an analysis of a one-component system under steady illumination at a wavelength which is absorbed by the molecules and then converted into heat. Such a system may generate and amplify sound waves. (Modified author abstract)

AD-780 917/1GA PC$4.00/MF$1.45
Purdue Univ Lafayette Ind Project Squid Headquarters
ON A VARIETY OF WAVE PHENOMENA IN CHEMICAL REACTIONS.
Technical rept.,
Peter Ortoleva, and John Ross. Mar 74, 83p Rept no. SQUID-TR-MIT-83-PU
Contract N00014-67-A-0226-0005
Prepared in cooperation with Massachusetts Inst. of Tech., Cambridge.

Descriptors: *Reaction kinetics, *Waves, Heterogeneity, Concentration(Composition), Transport properties, Chemical reactions, Diffusion, Steady state, Wave equations.
Identifiers: Bifurcation theory, Squid project, Symmetry breaking.

A variety of wave phenomena are analyzed and discussed for systems in which chemical reactions and transport take place. The authors consider both wave induction by heterogeneities and autonomous waves and seek perturbation solutions which provide the dispersion relation and the wave vector dependence of the amplitude for one-parameter families of waves characterized by the wave vector. For the case of an arbitrary reaction mechanism possessing a homogeneous steady state they derive, by use of bifurcation theory and frequency renormalization, small amplitude autonomous plane waves and standing and rotating waves. Various types of behavior are illustrated with a model. Wave extensions from a homogeneous limit cycle are investigated. For heterogeneous systems the relation of phase diffusion waves to kinematic waves is shown. The problem of bifurcation with symmetry breaking in a homogeneous limit cycle is analyzed with a small amplitude perturbation method. (Modified author abstract)

AD-780 926/2GA PC$3.00/MF$1.45
Air Force Rocket Propulsion Lab Edwards AFB Calif
CONTINUOUS VAPORIZATION OF LIQUID FLUORINE DURING TEST OPERATIONS.
Final rept. Sep 69-Mar 74,
Steven A. Bluhm. May 74, 10p Rept no. AFRPL-TR-74-18

Descriptors: *Vaporization, *Chemical lasers, *Gas generating systems, Liquefied gases, Fluorine.
Identifiers: Design, *Liquid fluorine.

A liquid fluorine system capable of continuous vaporization was designed and installed at the AFRPL to support continuous wave chemical laser experiments. Using a modified commercial vaporizer, the system vaporized liquid fluorine during eight chemical laser tests with no malfunctions. The nominal operating parameters were 550 psig, 40 grams/sec, and 20 minutes duration. Based upon experience with this system, liquid fluorine can be vaporized continuously in a safe, efficient and environmentally-sound manner. (Author)

AD-780 934/6GA PC$3.00/MF$1.45
Cornell Univ Ithaca N Y
BINDING, VALENCY AND CHARGE TRANSFER IN CHEMICAL REACTIONS ON METAL SURFACES.
Final rept. 4 Jan 71-3 Jan 74,
Thor N. Rhodin. Jun 74, 9p AROD-8961.15-MC
Grant DA-ARO-D-31-124-71-G-56

Descriptors: *Surface reactions, *Surface chemistry, Single crystals, Adsorption, Chemical bonds, Metals, Tungsten, Nickel, Auger electron spectroscopy, Field emission, Electron diffraction, Chemisorption, Work functions, Electron emission.
Identifiers: Low energy electron diffraction.

Fundamental studies of microscopic parameters relating to the binding and reaction of single atoms and of monolayers of molecules and atoms on clean surfaces of single crystal surfaces of tungsten and of nickel have been completed. These measurements involve field electron emission, LEED intensity analysis, work function measurements and Auger electron analysis. The results make substantial contributions to the microscopic theory of chemical binding on metal surfaces and to the surface atomic crystallography of both clean and chemisorbed surfaces. (Author)

AD-780 941/1GA PC$6.25/MF$1.45
Naval Research Lab Washington D C
AN EXPERIMENTAL INVESTIGATION NUCLEATE BOILING IN THIN LIQUID FILMS.
Master's thesis,
Almon D. Rivers. Jun 74, 61p

Descriptors: *Fluorohydrocarbons, *Nucleate boiling, Heat transfer, Heat flux, Thin films, Cholesterol, Liquid crystals, Color photography, Surface temperature, Bubbles, Measurement, Theses.

Experimental data was taken to determine the heat transfer coefficient during boiling of Freon 113 in thin liquid films from a horizontal, rectangular foil .025 mm thick. Heat flux was held constant at 8, 12, 16 and 32 thousand watts/sqm as liquid level was lowered from 18mm to 0.2mm below which dryout usually occurred. Surface temperature of the foil was qualitatively mapped with Cholesteric Liquid Crystals. This mapping was recorded and is presented by color photographs. There is an increase in heat transfer coefficient as liquid level is lowered below 2.0 mm for Freon 113. Liquid Crystals are a practical means of mapping the nucleation sites on the surface of a thin foil boiling test section. The heating surface under the bubbles forming on the surface is cooler than under the undisturbed liquid. As heat flux increases the number of active nucleation sites also increases. (Modified author abstract)

AD-780 947/8GA PC$3.75/MF$1.45
State Univ of New York Buffalo Dept of Chemistry
THE INVESTIGATION OF PROPANE OXIDATION USING ELECTROCHEMICAL MASS SPECTROMETRY.
Semiannual rept. no. 4, Jan-Jun 73,
Joseph K. Comeau, and Stanley Bruckenstein. Jun 73, 67p
Contract DAAK02-71-C-0306
See also report dated Dec 72, AD-762 356.

Descriptors: *Propane, *Oxidation, *Electrochemistry, *Adsorption, *Surface reactions, Platinum, Anodes(Electrolytic cell), Desorption, Surface chemistry, Mass spectroscopy, Steady state, Cathodes(Electrolytic cell).

The report is the fourth in a series dealing with propane electrooxidation on platinum at 100C in 12M H3PO4 using the technique of Electrochemical Mass Spectrometry (EMS). A study of oxidation processes is presented along with studies of propane adsorption at 0.40 V and 0.25 V, and at open circuit. The steady state current-potential curve for propane is discussed. The non-steady state oxidation of propane was studied at 0.40 V. Adsorption-desorption phenomena have been used to investigate the anodic behavior of propane at 0.40 V. The study was conducted principally to determine the effect of steady state oxidation on the adsorbate. The authors studied open-circuit adsorption of propane on platinum. The time dependencies of electrode phenomena at 0.25 V and at open circuit are presented and discussed. Using impurity corrected adsorption and charge data, the oxidation states of total, cathodically desorbable, and non-cathodically desorbable adsorbates formed at 0.25 V were determined. The results are summarized.

AD-780 952/8GA PC$3.25/MF$1.45
American Univ Washington D C
RESEARCH ON ELECTROCHEMICAL ENERGY CONVERSION SYSTEMS.
Interim technical rept. no. 4, Apr-Oct 73,
Alayne A. Adams, Robert T. Foley, and Richard M. Goodman. Feb 74, 43p
Contract DAAK02-72-C-0084
See also Interim technical rept. no. 3, AD-766 329.

Descriptors: *Fuel cells, Hydrates, Air, Propane, Sulfonic acids, Electrolytes, Fluorine compounds, Carboxylic acids, Solubility.
Identifiers: *Hydrocarbon air fuel cells, *Fuel cell electrolytes, Methanesulfonic acid/trifluoro, Butyrix acid/heptafluoro.

The research on electrochemical energy conversion systems has involved a search for electrolytes alternative to phosphoric acid for direct and indirect hydrocarbon-air fuel cells. It has concentrated on trifluoromethanesulfonic acid monohydrate and perfluorobutyric acid. Experiments in which hydrogen was electrooxidized showed that the enhanced performance of the sulfonic acid is not restricted to propane. Further, it is indicated that adsorption intermediates of the type seen in phosphoric acid and detrimental to the efficiency of the process are absent in this electrolyte. The electro oxidation of propane in perfluorobutyric acid proceeds at a lower rate than in CF3SO3H.H2. An apparatus and technique to measure the solubility of gases in electrolytes was installed. Preliminary measurements of the solubility of propane in CF3SO3H.H2O are in the same range as those reported for H3PO4. (Modified author abstract)

AD-780 955/1GA PC$3.00/MF$1.45
Battelle Columbus Labs Ohio
DEVELOPMENT OF GASEOUS MEDIA FOR SEF (SEQUENTIAL EXCITATION OF FLUORESCENCE) 3-DIMENSIONAL DISPLAYS.
Annual rept. 22 Jan 73-28 Feb 74,
R. H. Barnes, C. E. Moeller, J. F. Kircher, and C. M. Verber. Jun 74, 17p
Contract N00014-73-C-0254

Descriptors: *Optical pumping, *Fluorescence, *Iodine, *Excitation, Absorption spectra, Emission spectra, Electron transitions, Display systems, Fluorides, Iodine compounds, Spectrum analysis, Gases.
Identifiers: *Three dimensional display systems, Laser induced fluorescence, Iodine chloride.

The report covers the first year's effort related to the development of gaseous display media for three-dimensional display systems based on two-step excitation of fluorescence. The main emphasis was devoted to investigations involving the diatomic halogens I2 and ICl, and two-step excitation of fluorescence was demonstrated in ICl. Details regarding the continuing studies are discussed. (Author)

AD-780 964/3GA PC$4.00/MF$1.45
Miami Univ Coral Gables Fla Lab for Water Research
PREPARATION, PROPERTIES AND ORIGIN OF (DERJAGUIN'S) ANOMALOUS WATER AND GLASS/WATER REACTIONS.
Final rept.,
W. Drost-Hansen, and Paul D. Cratin. 28 Mar 74, 81p
Contract N00014-67-A-0201

Descriptors: *Water, Interfaces, Laboratory equipment, Contamination, Impurities, Anomalies, Experimental design, Thermal expansion, Capillary tubes, Creep, Thermodynamics.
Identifiers: *Polywater, Intermolecular forces.

Preparation, methods of measurement, and some properties are reported on anomalous aqueous condensates formed in capillaries from the vapor phase. Some thermodynamic calculations are presented and some comments made on the possibility of water and salt solutions 'creeping' over glass surfaces. It is concluded that anomalous water is not a novel form of water, but rather an experimental artifact, caused by contamination, most likely due to dissolution of the quartz (or glass) capillaries. The possible simultaneous effects of long-range ordering of interfacial water is also discussed. (Author)

AD-780 969/2GA PC$3.00/MF$1.45
Space Sciences Inc Monrovia Calif
A MASS SPECTROMETRIC INVESTIGATION OF ADDITIVES IN ALKALI-SEEDED H2/O2 FLAMES.
Final technical rept. 1 Nov 68-30 Apr 74,
Milton Farber, S. P. Harris, R. D. Srivastava, O. M. Uy, and G. W. Wheeler. 31 May 74, 23p
Contract N00014-69-C-0014
See also AD-743 514.

Descriptors: *Flames, *Aluminum, *Fluorine, Vanadium, Chromium, Mass spectra, High temperature, Tungsten, Molybdenum, Boron, Iron, Rhenium, Arsenic, Antimony, Aluminum, Fluorine, Oxidation, Potassium, Chemical reactions, Thermodynamics, Reaction kinetics, Hydrogen, Oxygen, Experimental design, Scientific research, Laboratory equipment, Abstracts.

The report concerns investigation of the chemical and thermodynamic reactions of various metal additives to unseeded and potassium seed atmospheric H2/O2 flames. A study of Al, F, H2/O2 reactions is included. Abstracts of other papers and reports which involved B, Mo, W, Cr, V, Fe, Re, As, and Sb as additives are presented. Experimental equipment and design are discussed.

AD-780 970/0GA PC$3.00/MF$1.45
Pittsburgh Univ Pa Dept of Physics
ATOMIC COLLISIONS AND PLASMA PHYSICS.
Final rept. 16 Dec 69-15 Dec 72,
Manfred A. Biondi. 24 May 74, 6p AROD-3187.16-P
Grant DA-ARO-D-31-124-70-G34

Descriptors: *Scientific research, *Atmospheric chemistry, Water vapor, Oxygen, Charge transfer, Gas ionization, Afterglows, Particle collisions, Upper atmosphere, Nitrogen oxides, Helium.
Identifiers: Ion molecule interactions.

Research results concerning atmospheric ion reactions are briefly summarized. Measurements of the coefficients of recombination of electrons with positive ions of the H3O(+).(H2O)n series have

been carried out. Clustering of NO(+) ions to N2 and to H2O has been studied to clarify the cluster-switching sequence responsible for D-region production of H3O(+).(H2O)n series ions. Reaction rates of O(+) with N2 and O2 to form NO(+) and O2(+) at high ion temperatures (F-region conditions) have been determined. Ionization and electron heating by metastable atoms have been studied in very pure helium afterglows. (Modified author abstract)

AD-780 978/3GA Reprint
Frankford Arsenal Philadelphia Pa
HYDROGEN BONDING OF DETERRENTS TO UNESTERIFIED HYDROXYL GROUPS IN NITROCELLULOSE,
Bruce W. Brodman, Michael P. Devine, and Michael T. Gurbarge. 15 Oct 73, 7p Rept no. FA-A74-9
Availability: Pub. in Jnl. of Applied Polymer Science, v18 p943-946 1974.

Descriptors: *Nitrocellulose, *Inhibitors, Ureides, Chemical bonds, Infrared spectra, Terpenes, Combustion, Phthalates, Propellants.
Identifiers: *Hydrogen bonds, Camphor, Phthalic acid/(dibutyl-ester), Urea/diethyl-diphenyl, Urea/dimethyl-diphenyl.

The hydrogen bonding of four small arms propellant deterrents (di-n-butyl phthalate (I), Camphor (II), N,N'-diethyl-N,N'-diphenylurea (III), N, N'-dimethyl-N, N'-diphenylurea (IV)) to unesterified hydroxyl groups in nitro-cellulose was studied by means of infrared spectroscopy. The results indicate that the carbonyl groups of compounds I and II were involved in the hydrogen bonding with nitrocellulose white interactions were postulated for both the carbonyl group and the nitrogen atom of compounds III and IV. Bond lengths were determined for the carbonyl-hydroxyl hydrogen bonds. (Author)

AD-780 993/2GA Reprint
Air Force Cambridge Research Labs L G Hanscom Field Mass
QUADRUPOLE MOMENT OF CO, N2, AND NO(+),
F. P. Billingsley, II, and M. Krauss. 26 Nov 73, 7p Rept no. AFCRL-TR-74-0228
Availability: Pub. in The Jnl. of Chemical Physics, v60 n7 p2767-2772, 1 Apr 74.

Descriptors: *Quadrupole moment, *Carbon monoxide, *Nitrogen, *Nitrogen oxides, Ions, Wave functions.
Identifiers: Self consistent field method, Hartree-Fock method.

Quadrupole moments obtained by a variety of experiments exhibit a wide range of values even for molecules such as CO and N2. Previous theoretical values were obtained with Hartree-Fock single-configuration wavefunctions. This study reports quadrupole moments obtained with multiconfiguration self-consistent-field wavefunctions chosen by the optimized valence configuration approach of Wahl and Das. The theoretical MC-SCF quadrupole moments are compared with both the experimental and Hartree-Fock values. Vibrationally averaged valued of the quadrupole moments were obtained for CO and NO(4). (Modified author abstract)

AD-781 060/9GA Not available NTIS
National Research Council of Canada Ottawa (Ontario) Div of Chemistry
THE THERMODYNAMIC PROPERTIES OF ACETONE + CYCLOPENTANOL MIXTURES AT 298.15K,
Osamu Kiyohara, S. C. Anand, and G. C. Benson. 5 Jul 73, 7p NRC-13824
Availability: Pub. in Jnl. of Chemical Thermodynamics, v6 p355-360 1974.

Descriptors: *Acetones, Equilibrium(General), Thermodynamics, Mixtures, Volume, Enthalpy, Phase transformations, Alcohols, Cyclopentanes, Canada.
Identifiers: *Cyclopentanol.

Excess enthalpies, excess volumes, and vapor-liquid equilibria were determined for acetone + cyclopentanol mixtures at 298.15K. The behavior of the excess properties of acetone + alcohol mixtures is discussed. (Author)

AD-781 067/4GA Reprint
Belfer Graduate School of Science New York
ON THE TRANSPORT PROPERTIES OF A VAN DER WAALS FLUID. I. FORMAL THEORY,
J. Piasecki, and P. Resibois. 6 Mar 72, 23p AFOSR-TR-74-0906
Grant AF-AFOSR-2430-73
Prepared in cooperation with Brussels Univ. (Belgium). Faculte des Sciences.
Availability: Pub. in Jnl. of Mathematical Physics, v14 n12 p1984-2004 Dec 73.

Descriptors: *Transport properties, *Fluids, Particle collisions, Theory, Hydrodynamics.
Identifiers: *Van der Waals forces.

The authors present a formal exact analysis of the autocorrelation formulas for transport coefficients in a van der Waals fluid. It is shown that the first correction due to the long range force is of order gamma (gamma = inverse range of the force) and the formal expression for this correction is displayed in terms of the Prigogine-Balescu graphs. The analysis crucially rests upon a generalization of hydrodynamical modes in a van der Waals Fluid, valid for wave numbers smaller or of the order of gamma. (Modified author abstarct)

AD-781 073/2GA Reprint
Columbia Univ New York Dept of Chemistry
FLUORESCENCE OF FREE RADICALS: A METHOD FOR DETERMINING DISSOCIATION ENERGY LIMITS.
Interim rept.,
Richard N. Zare. 1974, 8p AFOSR-TR-74-0910
Grants AF-AFOSR-2275-72, DA-ARO-D-31-124-73-G82
Availability: Pub. in Berichte Bunsen Gesellschaft, v78 n2 p153-157 1974.

Descriptors: *Dissociation, *Chemiluminescence, *Free radicals, Alumina, Emission spectra, Fluorescence.
Identifiers: *Laser induced fluorescence, *Aluminum oxide, Atom molecule interactions.

In an elementary gas-phase atom-transfer reaction, A+BC to AB+C, a lower bound to the dissociation energy of the AB molecule can be deduced from a knowledge of the dissociation energy of the BC molecule and from the knowledge of the highest internal state of the AB product that is populated by the reactive collision process. This latter information may be obtained spectroscopically either from detection of AB chemiluminescence or from detection of the AB product through laser-induced fluorescence. These two methods are illustrated for the elementary reactions Al+O3 and Al+O2. (Modified author abstract)

AD-781 075/7GA PCS4.25/MFS1.45
California Univ Berkeley Dept of Chemical Engineering
ATOMIC AND MOLECULAR SCATTERING, DIFFRACTION AND TRAPPING ON TUNGSTEN AND PLATINUM SURFACES,
W. Henry Weinberg, and Robert P. Merrill. 1972, 22p AFOSR-TR-74-0902
Grant AF-AFOSR-1409-68
Pub. in Proceedings of the International Conference on Adsorption-Desorption Phenomena (2nd) Florence. Apr 71, p151-168 1972.

Descriptors: *Tungsten, *Platinum, Surface roughness, Diffraction, Surfaces, Scattering, Atoms, Molecules, Surface properties, Inelastic scattering, Elastic scattering, Rare gases.
Identifiers: *Surface scattering, Gas surface interactions.

Atomic and molecular scattering from tungsten and platinum surfaces is discussed. The phenomenological regimes of quasi-elastic, inelastic and trapping dominated scattering are identified. The role of the strength of the surface periodicity in producing diffractive scattering is discussed and the extreme sensitivity of non-diffractive helium scattering to microscopic surface roughness is identified. (Author) Portions of this document are not fully legible.

AD-781 077/3GA Reprint
Columbia Univ New York Dept of Chemistry
RADIATIVE LIFETIMES OF THE ALKALINE EARTH MONOHALIDES,
Paul J. Dagdigian, Howard W. Cruse, and Richard N. Zare. 15 Nov 73, 13p AFOSR-TR-74-0911
Contract N00014-67-A-0108-0035, Grant AF-AFOSR-2551-73
Availability: Pub. in The Jnl. of Chemical Physics, v60 n6 p2330-2339, 15 Mar 74.

Descriptors: *Alkaline earth compounds, *Halides, *Fluorescence, Iodides, Relaxation time, Molecular energy levels, Fluorides, Chlorides, Bromides, Calcium compounds, Strontium compounds, Barium compounds, Electron transitions, Molecular orbitals.
Identifiers: Laser induced fluorescence.

The radiative lifetimes for a number of electronic states of the alkaline earth monohalide molecules MX, where M denotes Ca, Sr, or Ba and where X denotes F, Cl, Br, or I, have been determined directly from the rate of fluorescence decay with time using a pulsed dye laser as an excitation source. Various one-electron models for the MX transitions are discussed. It is found that a consistent explanation of the transition moments can be obtained by assuming that the transition is between two nonbonding orbitals centered on the metal atom whose mixing coefficients in terms of a truncated metal atom basis set are adjusted to reproduce a subset of the experimentally determined transition moments. (Modified author abstract)

AD-781 081/5GA Reprint
Carnegie-Mellon Univ Pittsburgh Pa Dept of Physics
THERMODYNAMIC MODEL FOR TRICRITICAL POINTS IN TERNARY AND QUATERNARY FLUID MIXTURES,
Robert B. Griffiths. 21 May 73, 14p AFOSR-TR-74-0860
Grant AF-AFOSR-2311-72
Availability: Pub. in Jnl. of Chemical Physics, v60 n1 p195-206, 1 Jan 74.

Descriptors: *Phase studies, Models, Phase transformations, Fluids, Mixtures, Phase diagrams, Free energy, Thermodynamics, Liquid helium.
Identifiers: *Critical point, Helium 3, Helium 4.

The properties of a phenomenological model of the Landau type (free energy expanded in powers of an order parameter) are worked out with special reference to published experimental data on tricritical points in three- and four-component fluid mixtures. When properly interpreted, the model is in good qualitative agreement with experiment. Suggestions are made for possible experimental measurements of the tricritical exponents. The model is also used to discuss the relation between these tricritical points (which are characterized by three phases becoming identical simultaneously) and other 'high-order' critical points, in particular the tricritical points observed in metamagnets, He3-He4 mixtures, etc. (Author)

AD-781 083/1GA Reprint
Texas Univ Austin Dept of Physics

ORBITAL-SYMMETRY RULES FOR CHEMISORPTION,
Leonard Kleinman. 24 Sep 73, 6p AFOSR-TR-74-0848
Grant AF-AFOSR-2308-72
Availability: Pub. in Physical Review B, v9 n4 p1989-1992, 15 Feb 74.

Descriptors: *Chemisorption, *Molecular orbitals, Symmetry, Graphite, Wave functions.
Identifiers: Symmetry(Quantum mechanics).

The authors show it to be true in general and in graphite, in particular, that if one takes the proper combinations of the degenerate wave functions of the star of k vector, the orbital symmetry rules for chemisorption can always be satisfied. (Modified author abstract)

AD-781 085/6GA Reprint
Massachusetts Inst of Tech Cambridge Dept of Chemistry
MOLECULAR BEAM MASER MEASUREMENTS RELAXATION CROSS SECTIONS IN NH3,
S. G. Kukolich, John H. S. Wang, and D. E. Oates. 6 Apr 73, 8p AFOSR-TR-74-0912
Grant AF-AFOSR-2032-71
Availability: Pub. in Chemical Physics Letters, v20 n6 p519-524 Jul 73.

Descriptors: *Ammonia, *Scattering cross sections, Inversion, Molecular beams, Relaxation, Transitions, Molecular energy levels, Masers, Dipole moments.
Identifiers: *Molecular relaxation.

Direct measurements of scattering cross sections for NH3 in well-defined quantum states are made using a molecular beam maser spectrometer. Cross sections are compared for a pure inversion state with those for a coherent superposition state for scattering gases He, Ar, H2, N2O, NH3, CF3H and CH3CN. The cross sections are significantly larger for scattering of the pure inversion state by NH3, CF3H, and CH3CN than for scattering of the superposition state. The scattering is the same for both states on non-polar gases. These cross sections are related to relaxation parameters describing transitions between rotation and inversion states. (Author)

AD-781 088/0GA Reprint
Carnegie-Mellon Univ Pittsburgh Pa Dept of Physics
MULTICOMPONENT-FLUID TRICRITICAL POINTS,
Robert B. Griffiths, and Benjamin Widom. 21 May 73, 5p AFOSR-TR-74-0861
Grant AF-AFOSR-2311-72
Prepared in cooperation with Cornell Univ., Ithaca, N.Y. Dept. of Chemistry.
Availability: Pub. in Physical Review A, v8 n4 p2173-2175 Oct 73.

Descriptors: *Phase transformations, Phase studies, Fluids, Liquid helium, Mixtures.
Identifiers: *Critical point.

Phenomena in 'ordinary' fluid mixtures (such as CH3OH-H2O-CO2) which are analogous to tricritical points in He3-He4 mixtures, metamagnets, etc. have been reported for some years in the Soviet physical-chemistry journals. References to these papers are given, together with a brief explanation of why the two types of phase transition are analogous, and reasons why further experiments on the 'ordinary' mixtures would be of interest. (Author)

AD-781 089/8GA Reprint
Nevada Univ Reno Dept of Chemistry
TEMPERATURE DEPENDENCE OF THE PROBABILITY OF VIBRATION-VIBRATION-ROTATION ENERGY TRANSFER IN HCL(V = 2) + HCL(V = O YIELDS TO HCL(V = 1) + HCL(V = 1),
Hyung Kyu Shin. 26 Nov 73, 8p AFOSR-TR-74-0889
Grant AF-AFOSR-2231-72
Availability: Pub. in Jnl. of Chemical Physics, v60 n6 p2305-2309, 15 Mar 74.

Descriptors: *Hydrogen chloride, Transitions, Dipole moments, Molecular energy levels, Molecular vibration, Temperature, Energy transfer, Probability, Chemical bonds.
Identifiers: *Collisional energy transfer, Hydrogen bonds.

Energy transfer probabilities for the vibration-vibration process HCl(v=2) + HCl(v=0) to HCl(v=1) + HCl(v=1) + delta E = 102 wave number have been calculated in the temperature range of 300 - 1000 degrees Kelvin assuming that delta E is supplied or removed trhough the vibration-rotation process. The interaction potential is assumed as the sum of repulsive, attractive, dipole-dipole, and hydrogen-bond energy terms. It is shown that the probability decreases nearly linearly with rising temperature between 300 - 600 degrees Kelvin; this result agrees with experiment. After reaching a minimum value at 700 degrees Kelvin, the probability increases with temperature. The temperature dependence is explained in terms of the contribution of molecular attractions including dipole-dipole and hydrogen-bond terms and the effect of translational motion on the vibration-rotation process. (Author)

AD-781 090/6GA Reprint
Nevada Univ Reno Dept of Chemistry
SIMULTANEOUS VIBRATIONAL AND ROTATIONAL TRANSITIONS IN HF + AR.
Interim rept.,
Hyung Kyu Shin. 4 Sep 73, 17p Rept no. Contrib-S-1063 AFOSR-TR-74-0891
Grant AF-AFOSR-2231-72
Availability: Pub. in Jnl. of Korean Chemical Society, v18 n1 p12-24 1974.

Descriptors: *Hydrogen fluoride, *Transitions, Argon, Molecular rotation, Molecular energy levels, Molecular vibration, Relaxation.
Identifiers: Transition probabilities, Atom molecule interactions, *Molecular relaxation.

The importance of rotational transitions in the vibrational deexcitation of HF in HF + Ar collisions has been investigated by a semiclassical three-dimensional approach. Because of the inclusion of rotational transitions, this study gives vibrational transition probabilities which are very large compared to results of conventional vibration-to-translation energy transfer theories. Currently available experimental studies suggest that this effect is important and has to be included in rigorous calculations. (Author)

AD-781 091/4GA Reprint
Nevada Univ Reno Dept of Chemistry
TEMPERATURE DEPENDENCE OF V TO R, T ENERGY TRANSFER PROBABILITIES IN CARBON DIOXIDE (001) + HF/DF.
Interim rept.,
Hyung Kyu Shin. 31 Oct 73, 5p AFOSR-TR-74-0955
Grant AF-AFOSR-2231-72
Availability: Pub. in Jnl. of Chemical Physics, v60 n5 p2167-2168 1974.

Descriptors: *Carbon dioxide, *Energy transfer, Chemical bonds, Particle collisions, Transitions, Molecular energy levels, Temperature, Hydrogen fluoride, Molecular vibration, Molecular rotation.
Identifiers: Transition probabilities, *Hydrogen bonds, Molecular relaxation, Molecule molecule interactions.

Temperature dependence of vibration to rotation-translation energy transfer probabilities in carbon dioxide (001) + HF/DF to carbon dioxide (nm0) + HF/DF has been investigated in the range 300 - 1000 degrees Kelvin. It is shown that the negative temperature dependence of transition probabilities at lower temperatures and the appearance of the probability minimum at intermediate temperatures are due to the influence of hydrogen bond interaction. (Author)

AD-781 103/7GA Reprint
Florida Univ Gainesville Dept of Chemistry
DOUBLE MODULATION ATOMIC FLUORESCENCE FLAME SPECTROMETRY.
Interim rept.,
W. K. Fowler, D. O. Knapp, and J. D. Winefordner. 21 Nov 73, 5p AFOSR-TR-74-0899
Grant AF-AFOSR-1880-70
Revision of report dated 30 Jul 73.
Availability: Pub. in Jnl. of Analytical Chemistry, v46 n4 p601-602 Apr 74.

Descriptors: *Atomic spectroscopy, Chemical analysis, Metals, Sensitivity, Modulation, Fluorescence, Flames.
Identifiers: *Spectrochemical analysis, *Atomic fluorescence flame spectroscopy.

The limits of detection of nine elements in an air-acetylene flame and three elements in a nitrous oxide-acetylene flame using a 900-watt xenon arc are measured by double modulated atomic fluorescence flame spectrometry (DMAFFS). Although the present detection limits are inferior to those obtained in AFFS with line sources, the double modulated continuum source AFFS system compensates for scattering which is difficult to correct for in resonance fluorescence with line sources and allows the determination of several elements with only one source. (Modified author abstract)

AD-781 105/2GA Reprint
Indiana Univ Bloomington Dept of Chemistry
COMPTON SCATTERING OF HIGH-ENERGY ELECTRONS FROM HELIUM.
Interim rept.,
H. F. Wellenstein, and R. A. Bonham. 5 Sep 72, 7p AFOSR-TR-74-0908
Grant AF-AFOSR-1900-70
Revision of report dated 19 Jun 72.
Availability: Pub. in the Physical Review A, v7 n5 p1568-1572 May 73.

Descriptors: *Helium, *Compton scattering, *X rays, Electron spectroscopy, Differential cross sections.

The electron-impact energy-loss spectrum of He at a scattering angle of 7 degrees has been measured with an energy resolution of 2.7 eV full width at half-maximum using 25-keV incident electrons. A binary-encounter approximation was used to obtain the electron Compton profile from the cross-section differential with respect to both the energy loss of the incident electron and solid angle of the scattered electron. The electron Compton profile was corrected for interference scattering from pairs of target electrons and exchange. It was then compared to theoretical and x-ray experimental values for the Compton profile. The effects of background, mjltiple scattering, and energy resolution are discussed. The electron-impact and x-ray methods for measuring Compton profiles are compared. (Author)

AD-781 106/0GA Reprint
Indiana Univ Bloomington Dept of Chemistry
SECOND BORN ZERO ANGLE DIFFERENTIAL CROSS SECTIONS IN THE HIGH ENERGY LIMIT FOR THE ELECTRON IMPACT EXCITATION OF HE: THE 1 SINGLET S TO 2 TRIPLET S AND 2 TRIPLET P TRANSITIONS.
Interim rept.,
R. A. Bonham. 19 Jan 72, 11p AFOSR-TR-74-0909
Grant AF-AFOSR-1900-70
Availability: Pub. in the Jnl. of Chemical Physics, v57 n1 p1604-1612 Aug 72.

Descriptors: *Helium, *Differential cross sections, *Electron scattering, *Excitation, Electron irradiation, Electron transitions, Inelastic scattering.

The high energy limit of the inelastic differential cross section for the excitation of the 2 triplet S and 2 triplet P states of He from the ground state in the forward direction is investigated by expanding the T matrix in powers of V about zero scattering angle and considering all terms proportional to V and V squared where V is the interaction potential. It is shown that the leading terms in a power series in the reciprocal of the incident energy in this second Born infinite channel close coupling theory can qualitatively account for the observed enhancement of the exchange cross section in the forward direction over the predictions of the first Born theory. (Modified author abstract)

AD-781 120/1GA Reprint
California Univ Berkeley Dept of Chemical Engineering
CRYSTAL FIELD SURFACE ORBITAL-BOND-ENERGY BOND ORDER (CFSO-BEBO) CALCULATIONS OF ADSORPTION. II. CARBON MONOXIDE, OXYGEN AND CARBON DIOXIDE ON PLATINUM (111) AND OXYGEN ON NICKEL (111).
Interim rept.,
W. Henry Weinberg, and Robert P. Merrill. 20 Mar 73, 34p AFOSR-TR-74-0901
Grant AF-AFOSR-2218-72
Prepared in cooperation with California Inst. of Tech., Pasadena. Div. of Chemistry and Chemical Engineering. See also AD-760 835. Revision of report dated 25 Jan 73.
Availability: Pub. in Surface Science, v39 p206-236 1973.

Descriptors: *Chemisorption, *Surface chemistry, Activation energy, Carbon dioxide, Carbon monoxide, Oxygen, Platinum, Nickel, Surfaces, Molecular orbitals, Crystals, Chemical bonds, Atomic orbitals.
Identifiers: Ligand fields, Crystal field surface orbital bond energy bond order model, Heat of adsorption.

The Crystal Field Surface Orbital-Bond Energy Bond Order (CFSO-BEBO) model of chemisorption is applied to the interaction of carbon monoxide, oxygen and carbon dioxide with a (111) platinum surface; and the interaction of oxygen with a (111) nickel surface. The molecular state and vibrational stretching frequencies are calculated by combining the CFSO-BEBO model with Badger's Rule. The adsorption of oxygen on (111) platinum and (111) nickel are compared. All of the calculated results are essentially in quantitative agreement with available experimental data. (Modified author abstract)

ANL-Trans-951 PC$4.75/MF$1.45
Gosudarstvennyj Komitet Po Ispol'Zovaniyu Atomnoj Ehnergii Sssr, Moscow. Inst. Teoreticheskoj I Ehksperimental'Noj Fiziki.
COHERENT EXCITATION BY THE PERIODIC FIELD OF CRYSTAL.
V. V. Okorokov, D. I.. Tolchenkov, Yu. P. Cheblukov, I. S. Khizhyakov, and Yu. Ya. Lapickii. Apr 74, 33p
Translation of ITEF--19.

Descriptors: (*Helium ions, *Energy levels), (*Nuclei, Energy levels), (*Crystals, *Charged-particle transport), Cations, Excitation, Lattice vibrations, Slowing-down.

For abstract, see NSA 30 01, number 01233.

BNL-tr-555 PC$3.00/MF$1.45
An Sssr, Moscow. Inst. Teoreticheskoj Fiziki.
PHASE TRANSITION IN A GENERALIZED ONE-DIMENSIONAL ISING MODEL.
M. Ya. Azbel. 1973, 10p
Translated by S. J. Amoretty from LITP--4715.

Descriptors: (*Polymers, *Phase transformations), Distribution functions, One-dimensional calculations, Thermodynamics.

For abstract, see NSA 30 01, number 02318.

BUP-58 PC$4.25/MF$1.45
Bergen Univ. (Norway). Dept. Of Physics.
UNIVERSAL CROSS SECTIONS FOR K, L, AND M SHELL COULOMB IONIZATION BY PROTON IMPACT (A NUMERICAL GUIDE).
L. Kocbach. Nov 73, 23p

Descriptors: (*Silver, *Ion collisions), (*Gold, Ion collisions), (*Hydrogen ions 1 plus, *Collisions), Coulomb excitation, Cross sections, Diagrams, Electronic structure, Ionization, Mathematical models, Protons, Semiclassical approximation, Tables.

For abstract, see NSA 30 01, number 01268.

BUP-61 PC$4.00/MF$1.45
Bergen Univ. (Norway). Dept. Of Physics.
COULOMB IONIZATION OF THE L SUB-SHELLS BY HEAVY CHARGED PROJECTILES.
J. M. Hansteen, O. M. Johnsen, and L. Kocbach. Mar 74, 11p

Descriptors: (*Lead, Ion collisions), (*Ion collisions, *Ionization), Coulomb excitation, Electronic structure, Electrons, Energy, Impact parameter, Kev range 100-1000, Mev range 01-10, Probability, Proton beams, Semiclassical approximation, Wave functions.

For abstract, see NSA 30 01, number 01269.

CEA-CONF-2547 PC$3.00/MF$1.45
Cea Centre d'Etudes Nucleaires de Grenoble, 38 (France). Dept. De Recherche Fondamentale.
PARAMAGNETIC EXCITON DYNAMICS STUDIED BY MEASUREMENTS OF NUCLEAR RELAXATION TIMES T/SUB 1D/ AND T/SUB 1 RHO/.
F. Devreux, and M. Nechtschein. 1973, 4p CONF-730857-1

Descriptors: (*Molecules, *Excitons), Electron spin resonance, Nuclear magnetic resonance, Relaxation.

For abstract, see NSA 30 01, number 02392.

CEA-N-1685 PC$6.75/MF$1.45
Cea Centre d'Etudes Nucleaires de Saclay, 91 - Gif-sur-Yvette (France). Dept. De Recherche et Analyse.
MEASUREMENT OF NATURAL CONCENTRATIONS OF TRITIUM PRESENT IN SMALL QUANTITIES OF WATER.
J. Jouzel. Jan 74, 75p
In French.

Descriptors: (*Tritium, *Radiometric analysis), (*Water, *Chemical analysis), (*Hail, Chemical analysis), Accuracy, Counting techniques, Proportional counters, Sample preparation, Tritium compounds.

For abstract, see NSA 30 01, number 00084.

COM-74-50271-02/GA PC-GPO/MF$1.45-NTIS
National Bureau of Standards, Washington, D.C.
JOURNAL OF RESEARCH OF THE NATIONAL BUREAU OF STANDARDS: A, PHYSICS AND CHEMISTRY. VOLUME 78A, NUMBER 2, MARCH-APRIL 1974.
Bi-monthly rept.
1974, 222p NBS-JRA-78A-2, JNBAAR-78A(2)
Library of Congress Catalog Card no. 62-37059.
Paper copy available from GPO $17.00/year as C13.22/secA:78.

Descriptors: *Research projects, *Chemistry, Acetal resins, Crystal structure, Electron microscopy, Alkanes, Esters, Ketones, Vanadium, Grain boundaries, Energy levels, Thorium, Gases, Infared spectra, Fluorohydrocarbons.
Identifiers: Ethane/hexafluoro.

Contents:
- The formation of curved polymer crystals: Polyoxymethylene;
- Solid-phase behavior of several long-chain n-paraffins, esters, and a ketone;
- Simultaneous measurements of heat capacity, electrical resistivity, and hemispherical total emittance by a pulse heating technique:
- Vanadium, 1500 to 2100 K;
- The shape of idealized grain boundaries;
- Reactions of fluorocarbon ions in C2F6. Implications for the radiolysis;
- A simple technique for the generation of dilute mixtures of pollutant gases;
- Energy levels and classified lines in the second spectrum of thorium (Th II);
- Proposed secondary wavelength standards and line classifications in thorium spectra between 0.9 and 3 microometers;
- Publications of the National Bureau of Standards.

CONF-740111-1 PC$3.00/MF$1.45
Puerto Rico Nuclear Center, Rio Piedras.
IONIZATION POTENTIALS OF ARYL SUBSTITUTED N-T-BUTYL BENZAMIDES.
A. McB. Block, R. Tsai, and G. M. Rubottom. 1973, 4p

Descriptors: (*Amides, *Ionization potential), (*Butyl radicals, Ionization potential), (*Benzyl radicals, Ionization potential), Aryl radicals, Mass spectra.

For abstract, see NSA 30 01, number 02274.

CONF-740311-2 PC$4.25/MF$1.45
Oak Ridge National Lab., Tenn. (Usa).
SEPARATION OF TRACE RADIONUCLIDES BY ION EXCHANGE IN THE PRESENCE OF OTHER COMPETING IONS.
K. H. Lin. 44p

Descriptors: (*Cesium 137, *Ion exchange), (*Strontium 85, Ion exchange), (*Iodine 131, Ion exchange), Boric acid, Lithium hydroxides, Sodium chlorides, Sodium phosphates.

For abstract, see NSA 30 01, number 00090.

COO-2092-29 PC$3.00/MF$1.45
Chicago Univ., Ill. (Usa).
CROSSED MOLECULAR BEAM STUDIES AND DYNAMICS OF DECOMPOSITION OF CHEMICALLY ACTIVATED RADICALS.
Y. T. Lee. 1973, 13p CONF-730987-1

Descriptors: (*Radicals, *Decomposition), Angular distribution, Chemical activation, Chemical reactions, Control, Energy transfer, Methyl radicals, Molecular beams, Molecule-molecule collisions, Molecules, Velocity.

For abstract, see NSA 30 01, number 02275.

FRNC-TH-467 PC$8.50/MF$1.45
Grenoble-1 Univ., 38 (France).
INTRODUCTION OF ACTIVATION ANALYSIS INTO BOTANY: ANALYSIS USING A FAST NEUTRON ACCELERATOR-GENERATOR. APPLICATION TO THE DETECTION AND MEASUREMENT OF POLLUTION IN ALPINE VALLEYS. EXAMPLES OF IMAGES OBTAINED USING RECOIL PROTONS.
J. P. Garrec. 1970, 109p
In French.

Descriptors: (*Fluorine, *Activation analysis), (*Plants, Activation analysis), Fast neutrons, Neutron reactions, Nondestructive analysis, Air pollution, Retention, Liquid wastes, Nitrogen, Phosphorus, Potassium, Water pollution, Neutron radiography, Photographic films, Proton detection, Recoils, Aquatic ecosystems, Cesium, Contamination, Fresh water, Sediments, Simulation, Strontium.

For abstract, see NSA 30 01, number 00003.

HU-TFT-73-34 PC$5.75/MF$1.45
Helsinki Univ. (Finland). Research Inst. For Theoretical Physics.
RECOIL EFFECTS IN QUANTUM ELECTRONICS: THE NONLINEAR MOLECULAR RESPONSE.
S. Stenholm. Dec 73, 51p

Descriptors: (*Molecule collisions, *Recoils), Absorption spectroscopy, Density matrix, Hamiltonians, Interactions, Kinetic equations, Molecules, Nonlinear problems, Perturbation theory, Quantum electrodynamics, Raman effect, Rayleigh scattering, Series expansion, Standing waves, Stark effect, Travelling waves, Velocity.

For abstract, see NSA 30 01, number 02262.

IAE-2256 PC$4.00/MF$1.45
Gosudarstvennyj Komitet Po Ispol'Zovaniyu Atomnoj Ehnergii Sssr, Moscow. Inst. Atomnoj Ehnergii.
CONCERNING THE EFFECT OF ATOMIC COLLISIONS ON THE CHARACTERIZATION OF LAMB FAILURE.
Yu. A. Vdovin, V. M. Galitskii, A. I. Gurevich, V. M. Ermachenko, and L. M. Satarov. 1973, 20p
In Russian.

Descriptors: (*Atom collisions, *Elastic scattering), (*Lamb shift, Atom collisions), Lasers.

For abstract, see NSA 30 01, number 01271.

IS-M-14 PC$4.25/MF$1.45
Ames Lab., Iowa (Usa).
ANALYTICAL METHODS FOR CHARACTERIZATION OF FLY ASH.
D. C. Cavin, W. A. Klemm, and G. Burnet. 21p

Descriptors: (*Fly ash, *Chemical analysis), Aluminium, Combustion, Iron, Physical properties, Power plants, Residues, Stack disposal, Wastes.

For abstract, see NSA 30 01, number 02279.

IS-T-610 PC$7.75/MF$1.45
Ames Lab., Iowa (Usa).
SCALE-UP OF A MIXER-SETTLER EXTRACTOR USING A UNIT OPERATIONS APPROACH.
D. C. Lindholm. Apr 74, 94p
Contract W-7405-eng-82

Descriptors: (*Lanthanum, *Solvent extraction), Chlorides, Hdehp, Mixer-settlers, Rare earth compounds.

For abstract, see NSA 30 01, number 00091.

JINR-E12-7744 PC$4.00/MF$1.45
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Nuclear Problems.
RAPID ELECTRODEPOSITION OF RADIOACTIVE RARE EARTH.
G. J. Beyer, and E. Herrmann. 1974, 12p

Descriptors: (*Rare earths, *Electrodeposition), Carrier-free isotopes.

For abstract, see NSA 30 01, number 00092.

KY-653 PC$4.00/MF$1.45
Paducah Gaseous Diffusion Plant, Ky. (Usa).
SPECTROGRAPHIC IMPURITY DETERMINATION AFTER PARTITION CHROMATOGRAPHY OF URANIUM.
D. E. Gordanier, and B. L. Winters. 28 Feb 74, 17p
Contract W-7405-eng-26

Descriptors: (*Uranium hexafluoride, *Chemical analysis), (*Uranium, *Chromatography), (*Aluminium, *Spectroscopy), (*Arsenic, Spectroscopy), Antimony, Barium, Beryllium, Bismuth, Cadmium, Calcium, Chromium, Cobalt, Copper, Dysprosium, Europium, Gadolinium, Gallium, Germanium, Indium, Iron, Lead, Lithium, Magnesium, Manganese, Molybdenum, Nickel, Niobium, Phosphorus, Potassium, Rubidium, Ruthenium, Samarium, Sodium, Strontium, Tantalum, Technetium, Thallium, Thorium, Tin, Titanium, Trace amounts, Tungsten, Vanadium, Zinc, Zirconium.

For abstract, see NSA 30 01, number 00061.

LA-5429 PC$4.00/MF$1.45
Los Alamos Scientific Lab., N.Mex. (Usa).
DETERMINATION OF URANIUM AND THORIUM IN CARBON AND SILICON CARBIDE-COATED URANIUM--THORIUM CARBIDE FUEL BEADS.
A. D. Hues, A. L. Henicksman, and W. H. Ashley. Oct 73, 9p
Contract W-7405-eng-36

Descriptors: (*Uranium, *Ion exchange), (*Thorium, Ion exchange), (*Thorium carbides, *Chemical analysis), (*Uranium carbides, Chemical analysis), Coated fuel particles, Quantitative chemical analysis, Silicon carbides, Titration, Xylenol orange.

For abstract, see NSA 30 01, number 00062.

NIM-1611 PC$4.00/MF$1.45
National Inst. For Metallurgy, Johannesburg (South Africa).
X-RAY-FLUORESCENCE DETERMINATION OF PERCENTAGE CONCENTRATIONS OF NIOBIUM AND TANTALUM IN ORES AND MINERALS.
B. T. Eddy, C. E. Austen, and B. G. Russell. 25 Jan 74, 17p

Descriptors: (*Tantalum, *X-ray fluorescence analysis), (*Niobium, X-ray fluorescence analysis), (*Ores, *Chemical analysis), (*Minerals, Chemical analysis), Accuracy, Quantitative chemical analysis.

For abstract, see NSA 30 01, number 00085.

N74-21692/0GA PC$4.25/MF$1.45
Varta Aktiengesellschaft Forschungs- und Entwicklungszentrum, Kelkheim (West Germany).
ELECTROLYTIC CELLS WITH ORGANIC ELECTROLYTES GALVANISCHE ZELLEN MIT ORGANISCHEN ELEKTROLYTEN ABSCHLUSSBERICHT.
Final Report.
H. Lauck. Jan 74, 22p BMFT-FBT-74-02
Subm-Sponsored by Bundesmin. Fuer Forsch. Und Technol.
In German; English Summary.

Descriptors: *Cell anodes, *Cell cathodes, *Electrolytic cells, *Organic liquids, Cell anodes, Cell cathodes, Electrolytes, Sulfur.

For abstract, see STAR 1213

N74-21773/8GA PC$4.00/MF$1.45
Scientific Translation Service, Santa Barbara, Calif.
POLAROGRAPHIC INVESTIGATION OF SLAGS, REPORT 2.
S. S. Ognyanik. 16 Apr 74, 10p NASA-TT-F-15459
Contract NASW-2483
Tran-Transl. Into English from Ukr. Khim. Zh. (Ukrainia SSR), V. 30, No. 4, 1964 p 337-341.

Descriptors: *Cerium oxides, *Copper oxides, *Polarography, *Sodium silicates, *Tin oxides, Chemical composition, Diffusion, Slags, Temperature effects.

For abstract, see STAR 1213

N74-21774/6GA PC$4.00/MF$1.45
Techtran Corp., Silver Spring, Md.
WORKS CONCERNING SILICA AEROGELS.
Progress Report.
M. Cantin. Dec 73, 14p NASA-TT-F-14790, SEP/SES-73/R.26-MC/FS
Contract NASW-2485
Tran-Transl. Into English of "Etat d'Avancement des Travaux sur les Aerogels de Silice", Rept. Sep/Ses-73/R.26-mc/Fs Centre d'Etudes Nucl. De Saclay, France, Apr. 1973 p 1-11.

Descriptors: *Cerenkov counters, *Gels, *Silicon dioxide, Opacity, Optical thickness, Photons, Refractivity.

For abstract, see STAR 1213

N74-21775/3GA PC$4.00/MF$1.45
Techtran Corp., Glen Burnie, Md.
IMPROVEMENTS APPLIED TO METHODS OF PREPARING INORGANIC AEROGELS.
J. T. Stanislas, J. Teichner, A. N. Gilbert, and A. Nicolaon. Dec 73, 13p NASA-TT-F-14791
Contract NASW-2485
Tran-Transl. Into English from French Patent No. 130417 (30 Nov. 1969) 7 p.

Descriptors: *Chemical engineering, *Gels, *Inorganic compounds, Cost analysis, Patent policy, Silicon dioxide.

For abstract, see STAR 1213

N74-21776/1GA PC$4.25/MF$1.45
Worcester Polytechnic Inst., Mass. Dept. of Chemical Engineering.
FABRICATION OF A GLYCEROL FROM CO2 REACTION SYSTEM, SUPPLEMENT.
Supplement to Final Report.
A. H. Weiss. 26 Dec 73, 25p NASA-CR-138132
Contract NGR-22-017-023

Descriptors: *Carbon dioxide, *Chemical engineering, *Equipment specifications, *Glycerols, *Hydrogenation, Chemical reactors, Reactor design.

For abstract, see STAR 1213

N74-21777/9GA PC$4.50/MF$1.45
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
MICROWAVE SPECTRA OF SOME SULFUR AND NITROGEN COMPOUNDS.
W. F. White. May 74, 105p NASA-TN-D-7450, L-9255

Descriptors: *Microwave spectra, *Nitrogen compounds, *Sulfur compounds, Chemical analysis, Spectrometers.

For abstract, see STAR 1213

N74-21779/5GA PC$4.00/MF$1.45
Explosives Research and Development Establishment, Waltham Abbey (England).
A TITRATOR WITH AUTOMATIC END-POINT DETECTION FOR WATER DETERMINATIONS BY KARL FISCHER REAGENT.
R. Durrant. Apr 73, 18p ERDE-TN-90, BR36273

Descriptors: *Karl fischer reagent, *Moisture content, *Titration, *Volumetric analysis, Ammonium perchlorates, Composite propellants, Moisture meters, Plasticizers.

For abstract, see STAR 1213

N74-22068/2GA PC$4.50/MF$1.45
Johann-Wolfgang-Goethe-Universitat, Frankfurt am Main (West Germany). Inst. fuer Meteorologie und Geophysik.
TEST OF A METHOD FOR MEASURING AMMONIUM AND AMMONIA IN THE PPB RANGE ERPROBUNG EINES VERFAHRENS ZUR MESSUNG VON AMMONIUM UND AMMONIAK IM PPB-BEREICH.
H. W. Georgii, D. Jost, and W. J. Mueller. May 73, 29p REPT-25
In German; English Summary.

Descriptors: *Air sampling, *Ammonia, *Atmospheric composition, *Gas analysis, Automatic test equipment, Hydrogen sulfide, Sulfur oxides, Sulfuric acid.

For abstract, see STAR 1213

N74-22069/0GA PC$8.50/MF$1.45
Johann-Wolfgang-Goethe-Universitat, Frankfurt am Main (West Germany). Inst. fuer Meteorologie und Geophysik.
OPERATIONAL TEST AND POSSIBLE APPLICATIONS OF A CONTINUOUS MEASURING SYSTEM FOR NITROUS GASES IN THE PPB RANGE FUNKTIONSPRUEFUNG UND EINSATZMOEGLICHKEITEN EINES KONTINUIERLICHEN MESSSYSTEMS FUER NITROSE GASE IM PPB-BEREICH.
H. W. Georgii, W. Grosch, and D. Jost. Aug 73, 109p REPT-26
Subm-Sponsored by Deut. Forschungsgemeinschaft.
In German; English Summary.

Descriptors: *Airborne equipment, *Atmospheric composition, *Gas detectors, *Monitors, *Nitrogen oxides, Portable equipment, Trace contaminants.

For abstract, see STAR 1213

N74-22098/9GA PC$4.75/MF$1.45
Stanford Univ., Calif. Dept. of Electrical Engineering.
RESEARCH ON MINIATURE GAS ANALYSIS SYSTEMS.
Interim Status Report, Sep. - Dec. 1973.
J. B. Angell. 2 Jan 74, 33p NASA-CR-138138
Contract NGR-05-020-690

Descriptors: *Chromatography, *Equipment specifications, *Gas analysis, *Microminiaturization, Gas valves, Measuring instruments, Thermistors.

For abstract, see STAR 1213

N74-22102/9GA PC$4.00/MF$1.45
Old Dominion Univ., Norfolk, Va.
INVESTIGATION OF GAS TEMPERATURE MEASUREMENTS USING ULTRAVIOLET EXCITATION.
Final Technical Report.
G. S. Ofelt. Oct 73, 18p NASA-CR-138114
Contract NGR-47-003-005

Descriptors: *Gas temperature, *Temperature measurement, *Ultraviolet spectrometers, Boltzmann distribution, Fluorescence, Nitrogen ions, Vibrational spectra.

For abstract, see STAR 1213

N74-22103/7GA PC$11.25/MF$1.45
TRW Systems Group, Redondo Beach, Calif.
WET CHEMISTRY INSTRUMENT PROTOTYPE.
Final Report.
31 Jan 74, 165p NASA-CR-114767, TRW-23197-6001-RU-00
Contract NAS2-7198

Descriptors: *Amino acids, *Chemical analysis, *Chemical tests, *Test equipment, Planetary composition, Planetary environments, Qualitative analysis.

For abstract, see STAR 1213

N74-22322/3GA PC$3.75/MF$1.45
National Bureau of Standards, Boulder, Colo. Cryogenics Div.
ASRDI OXYGEN TECHNOLOGY SURVEY. VOLUME 5: DENSITY AND LIQUID LEVEL MEASUREMENT INSTRUMENTATION FOR THE CRYOGENIC FLUIDS OXYGEN, HYDROGEN, AND NITROGEN.
H. M. Roder. 1974, 72p NASA-SP-3083-VOL-5
Subm-Sponsored by NASA.

Descriptors: *Cryogenic fluids, *Density measurement, *Liquid levels, *Oxygen supply equipment, Liquid hydrogen, Liquid nitrogen, Liquid oxygen, Technology assessment.

For abstract, see STAR 1213

N74-22336/3GA PC$4.00/MF$1.45
Tennessee Univ., Knoxville. Earth Resources and Astrophysics Lab.
NU SUB 1 PLUS NU SUB 3 COMBINATION BAND OF SO2.
R. J. Corice, Jr., K. Fox, and G. D. T. Tejwani. Dec 72, 17p NASA-CR-138119, UTPA-ERAL-03
Contract NGL-43-001-021

Descriptors: *Infrared spectra, *Spectral bands, *Spectral resolution, *Sulfur oxides, Graphs (Charts), Line spectra, Quantum numbers, Rotation, Tables (Data), Vibrational spectra.

For abstract, see STAR 1213

N74-22340/5GA PC$4.00/MF$1.45
Pittsburgh Univ., Pa. Dept. of Physics.
MEASUREMENTS OF ION-MOLECULE REACTIONS OF HE PLUS, H PLUS, HEH PLUS WITH H SUB 2 AND D SUB 2.
R. Johnsen, and M. A. Biondi. Apr 74, 15p NASA-CR-138190, APP-43
Contract NGR-39-011-137
Subm-Submitted for Publication.

Descriptors: *Deuterium, *Gas-ion interactions, *Helium, *Hydrogen, *Molecular spectra, Atmospheric models, Charge transfer, Ionic reactions, Jupiter atmosphere, Mass spectroscopy.

For abstract, see STAR 1213

N74-22342/1GA PC$4.25/MF$1.45
Linguistic Systems, Inc., Cambridge, Mass.
LIGHT EMISSION IN THE VACUUM ULTRAVIOLET THROUGH ELECTRON COLLISION EXCITATION IN GASES. PART A: INVESTIGATIONS IN OXYGEN.
W. Sroka. Apr 73, 22p NASA-TT-F-14728
Contract NASW-2482
Tran-Transl. Into English from Z. Naturforsch. (Tubingen), V. 23, 1968 p 2004-2013.

Descriptors: *Electron scattering, *Far ultraviolet radiation, *Light emission, *Oxygen, Electric fields, Electron beams, Monochromators.

For abstract, see STAR 1213

N74-22343/9GA PC$4.00/MF$1.45
Linguistic Systems, Inc., Cambridge, Mass.
PREDISSOCIATION IN AN ELECTRIC FIELD: A NEW PHENOMENON IN MOLECULAR SPECTROSCOPY.
F. J. Comes, and U. Wenning. Apr 73, 16p NASA-TT-F-14729
Contract NASW-2482
Tran-Transl. Into English from Z. Naturforsch. (Tubingen), V. 23A, 1970 p 406-411.

Descriptors: *Dissociation, *Electric fields, *Molecular spectroscopy, Deuterium, Electric field strength, Molecular collisions, Van der waal forces.

For abstract, see STAR 1213

N74-22345/4GA PC$6.50/MF$1.45
New York Univ., N.Y.
MODEL CALCULATIONS FOR DIFFUSE MOLECULAR CLOUDS.
A. E. Glassgold, and W. D. Langer. 1974, 69p
NASA-CR-138186
Contract NGR-33-016-0196

Descriptors: *Interstellar gas, *Mathematical models, *Plasma clouds, Abundance, Electron flux density, Hydrogen atoms, Hydrogen ions, Molecular gases, Radiative heat transfer.

For abstract, see STAR 1213

PAT-APPL-461 442 PC$4.00/MF$1.45
Department of Health, Education, and Welfare, Bethesda, Md. Patent Branch.
GEL SLAB ELECTROPHORESIS CELL AND ELECTROPHORESIS APPARATUS UTILIZING SAME.
Patent Application,
John I. Peterson, Andreas Chrambach, Julian W. Holland, William R. Dehn, and H. Douglas Swank.
Filed 16 Apr 74, 14p DHEW-E-149-72
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Patent applications, *Electrolytic cells, Ions, Gels, Separation.
Identifiers: *Gel electrophoresis.

The patent application describes an electrophoresis cell for use in the simultaneous electrophoresis of multiple samples in an elongated gel slab supporting medium in a multiphasic buffer system. The cell is provided with permanent sample partitions which define a plurality of individual sample-receiving compartments within the upper portion of the cell, enabling the cell to be used with mechanically labile stacking gels. The gel slab is prepared in situ within the cell, after which the samples are introduced into the partitioned compartments and electrophoresis carried out.

PATENT-3 485 028 Not available NTIS
Department of Agriculture, Washington, D.C.
THERMALLY STABLE STATIONARY PHASES FOR TEMPERATURE PROGRAMMED GAS CHROMATOGRAPHY.
Patent, *Filed 20 Dec 68, patented 23 Dec 69,
Verle L. Davison, Everett H. Pryde, and Danny J. Moore. 23 Dec 69, 3p PAT-APPL-785 594,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Gas chromatography, *Patents, *Column packings, *Acetal resins, Roasting, Temperature, Plastic coatings, Polyester resins, Polyamide resins, Crosslinking, Thermal stability, Resolution.
Identifiers: PAT-CL-55-386.

The patent concerns temperature-programmed gas chromatographic resolutions of mixtures composed of different classes of constituents. Improved performance can be obtained even with only one column where the diatomaceous support of the column has been calcined without flux and then has been coated with certain polyester acetals or polyamide acetals that have then been thermally crosslinked in situ and interbonded thereto. The resulting crosslinked stationary phases are highly resistant to bleeding even at temperatures above 250C. that volatize the conventional stationary phase materials, and also exhibit an unexpectedly broadened spectrum of sharply graded thermally releasable affinites for hydrocarbons, esters, and aldehydes, whereby a mixture of all three types can be analyzed or resolved with only one column.

PATENT-3 585 129 Not available NTIS
Department of Agriculture, Washington, D.C.
DUAL THICKNESS TLC PLATES AND DEVICE THEREFOR.
Patent,
Norman E. Delfel. Filed 28 Mar 69, patented 15 Jun 71, 5p PAT-APPL-835 835,
Previously filed as PAT-APPL-683 439, 14 Nov 67.
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Thin layer chromatography, *Adsorbents, *Spreaders, Coatings, Thickness, Resolution.
Identifiers: PAT-CL-210-198-C.

The patent concerns improved thin-layer chromatographic (TLC) resolution. They are obtained on plates on which the thickness of the continuous adsorbent layer is abruptly increased by a factor of about four or five to provide a narrow, deeply coated zone that increases the uptake of solvent. A spreader for readily preparing the dual thickness plates also is described.

PB-232 710/4GA PC$3.00/MF$1.45
National Environmental Research Center, Cincinnati, Ohio.
SIMULTANEOUS AND AUTOMATED DETERMINATION OF TOTAL PHOSPHORUS AND TOTAL KJELDAHL NITROGEN.
Environmental monitoring series,
Morris E. Gales, Jr., and Robert L. Booth. May 74, 23p EPA-670/4-74-002

Descriptors: *Colorimetric analysis, *Water analysis, Automation, Reviews, Water quality, Performance evaluation, Sludge, Catalysts, Sensitivity, Precision, Accuracy, Vanadium oxides, Inorganic acids.
Identifiers: *Kjeldahl method, *Nitrogen compounds, *Phosphorus compounds.

Milbury's method for the simultaneous determination of total phosphorus and total Kjeldahl nitrogen (TKN) in activated sludge has been modified for the automated determination of these constituents in surface waters, domestic and industrial wastes. Modifications were made to increase the sensitivity and to improve the accuracy for samples that contain amino acids. AutoAnalyzer I and II systems were developed with the helix digestion using a mixture of sulfuric acid, perchloric acid, and vanadium pentoxide as a catalyst. The applicable range is 0.10 to 10 mg N/l and 0.02 to 1.0 mg P/l. The phosphorus values obtained by this method on river water samples were comparable to those obtained by the U.S. Environmental Protection Agency Automated Single Reagent Method. The TKN values were also comparable to those obtained by the micro TKN method.

PB-233 048/8GA PC$6.00/MF$1.45
California State Dept. of Health, Berkeley. Air and Industrial Hygiene Lab.
A GUIDE TO THE EVALUATION OF ATMOSPHERIC ANALYZERS,
P. K. Mueller, Y. Tokiwa, E. R. deVera, W. J. Wehrmeister, and T. Belsky. Jun 73, 248p* EPA-650/4-74-014
Contract EPA-68-02-0214

Descriptors: *Gas detectors, *Monitors, Calibration, Performance evaluation, Tests, Gas analysis, Operations, Carbon monoxide, Nitrogen oxide(NO), Nitrogen dioxide, Ozone, Sulfur dioxide, Analyzers, Gas sampling.
Identifiers: *Air pollution monitoring.

Intelligent selection and application of atmospheric analyzers require complete, consistent, cohesive and unequivocal information regarding the physical and performance characteristics of these instruments. This guide is designed for use by operating personnel and provides (1) definitions for selected terms in air monitoring, (2) a listing of physical and performance characteristics for which information is needed, (3) recommended criteria for operating instructions, (4) test procedures for evaluating physical and performance characteristics of air analyzers, and (5) procedures for the calibration of analyzers for carbon monoxide, nitric oxide, nitrogen dioxide, ozone and oxidant, and sulfur dioxide.

PB-233 136/1GA PC-GPO/MF$1.45-NTIS
Battelle Columbus Labs., Ohio.
SPECIFIC ION MASS SPECTROMETRIC DETECTION FOR GAS CHROMATOGRAPHIC PESTICIDE ANALYSIS.
Environmental protection technology series,
Maynard B. Neher, and James R. Hoyland. Jan 74, 121p W74-08943, EPA-660/2-74-004
Grant EPA-R-800909
Paper copy available from GPO $1.55 as stock no. EP1.23:660/2-74-004.

Descriptors: *Gas chromatography, *Mass spectroscopy, *Pesticides, *Computer programs, Chemical analysis, Flow charts, Data acquisition, Ions, Signal to noise ratio, Data smoothing, Sensitivity.
Identifiers: PDP 8 computers.

Computer programs have been developed for a PDP8/e controlling a Finnigan 1015 quadrupole mass spectrometer to monitor selected ions from components in a gas chromatographic effluent. The program is designed to monitor only a few ions (1 to 8) to enhance the sensitivity for the selected ions. Signal-to-noise levels of 10:1-30:1 have been obtained for 0.2 ng or less of four pesticides employing chemical ionization mass spectrometry and a digital smoothing routine. (Modified author abstract)

PB-233 210/4GA PC-GPO/MF$1.45-NTIS
Bureau of Mines, Washington, D.C.
CHEMICAL THERMODYNAMIC PROPERTIES OF HYDROCARBONS AND RELATED SUBSTANCES. PROPERTIES OF THE ALKANE HYDROCARBONS, C1 THROUGH C10 IN THE IDEAL GAS STATE FROM 0 TO 1500 K.
Bulletin,
Donald W. Scott. May 74, 194p* BuMines-B-666
Prepared by Bartlesville Energy Research Center, Okla.
Paper copy available from GPO $2.55 as stock no. SN2404-01547, I28.3:666.

Descriptors: *Alkanes, *Thermodynamic properties, Thermochemical properties, Heat of formation, Temperature, Ideal gas, Enthalpy, Entropy, Specific heat, Gibbs free energy, Tables(Data), Chemical equilibrium.

Chemical thermodynamic properties for the ideal gas state from 0 to 1500 K are tabulated for all of the alkane hydrocarbons through C10. These properties are based on correlations of the extant data for the entropy, vapor heat capacity, and enthalpy of formation of individual alkanes and the equilibrium constants of alkane isomerization reactions. Properties reported include the Gibbs energy function enthalpy function, enthalpy, entropy, heat capacity, enthalpy of formation, Gibbs energy of formation and the log of the equilibrium constant of formations.

PB-233 271/6GA PC$4.00/MF$1.45
North Carolina Univ., Chapel Hill. Dept. of Environmental Sciences and Engineering.
THE ROLE OF POLYELECTROLYTES IN FILTRATION PROCESSES.
Environmental protection technology series 1 Sep 71-28 Feb 73,
Charles R. O'Melia. Apr 74, 91p EPA-670/2-74-032
Grant EPA-R-800351

Descriptors: *Filtration, *Filter aids, *Polyelectrolytes, *Sewage treatment, Dispersions, Suspended sediments, Transport properties, Waste water, Adsorption, Water treatment, Polymers, Calcium phosphates, Latex, Particles, Electrostatic charge, Fluid filters, Coagulation, Theory.
Identifiers: Poly(imine-ethylene), Chemical reaction mechanisms, Destabilizing chemicals.

This research has been conducted (1) to determine how destabilizing chemicals function in enhancing the effectiveness of filtration processes, and (2) to consider selected applications of destabilizing chemicals in filtration for the treatment of wastewaters. The investigations have included (1) laboratory experiments using polymers and latex suspensions, (2) laboratory and pilot plant experiments using alum, polymers, and trickling filter effluent, and (3) laboratory experiments using polymers and calcium phosphate suspensions. The report includes conclusions regarding the mechanisms of polymer action in filtration, the results that can be obtained using polymers as filter-aids, and the application of this knowledge to the design of filtration processes for wastewater treatment.

RFP-Trans-154 PC$4.00/MF$1.45
Institute of Nuclear Physics, Krakow (Poland).
COLUMN EXTRACTION CHROMATOGRAPHY OF INORGANIC COMPOUNDS.
I. Stronski. 1970, 20p
Translation of INP--803.

Descriptors: (*Rare earths, *Extraction chromatography), (*Transplutonium elements, Extraction chromatography), (*Actinides, Extraction chromatography), (*Uranium, Extraction chromatography), Chelates, Fission products, Reviews, Separation processes.

For abstract, see NSA 30 01, number 00063.

UCRL-51499 PC$5.45/MF$1.45
California Univ., Livermore (Usa). Lawrence Livermore Lab.
AEROSOL TRACE ELEMENT ANALYSIS USING NEUTRON ACTIVATION AND X-RAY FLUORESCENCE.
N. J. Roberts. 8 Feb 74, 127p
Contract W-7405-eng-48

Descriptors: (*Aerosols, *Activation analysis), (*Titanium, Activation analysis), (*Magnesium, Activation analysis), (*Copper, Activation analysis), Aluminium, Antimony, Arsenic, Barium, Bromine, Cadmium, Calcium, Cesium, Chlorine, Chromium, Cobalt, Europium, Gallium, Gold, Hafnium, Indium, Iodine, Iron, Lanthanum, Lead, Manganese, Mercury, Neutron reactions, Nondestructive analysis, Potassium, Quantitative chemical analysis, Samarium, Scandium, Selenium, Silver, Sodium, Strontium, Thorium, Trace amounts, Tungsten, Vanadium, X-ray fluorescence analysis, Zinc.

For abstract, see NSA 30 01, number 00004.

7E. Radio and Radiation Chemistry

AAEC/LIB/Bib-407 PC$4.25/MF$1.45
Australian Atomic Energy Commission Research Establishment, Lucas Heights.
URANIUM(III). A BIBLIOGRAPHY, 1965--1973.
P. J. Geue. Dec 73, 22p

Descriptors: (*Uranium, *Bibliographies), (*Uranium compounds, *Chemical reaction kinetics), Cations, Oxidation, Reduction, Valence.

For abstract, see NSA 30 01, number 00188.

AD-780 613/6GA PC$3.25/MF$1.45
Wayne State Univ Detroit Mich Dept of Chemistry

PROPERTIES OF ENERGETIC IONS TRAPPED IN SOLIDS OF INTEREST AS FUTURE ENERGY SOURCES.
Final rept. 1 Oct 69-30 Sep 73,
Larry Kevan. Dec 73, 31p AFOSR-TR-74-0800
Grant AF-AFOSR-1852-70

Descriptors: *Ions, *Radiation chemistry, Glass, Electrons, Electron mobility, Scientific research, Abstracts, Photoionization, Photoconductivity, Ice, Magnetic properties, Energy transfer, Electrical conductivity, Atomic energy levels, Electron paramagnetic resonance, Chemical radicals, Relaxation, Radiolysis.
Identifiers: *Matrix isolation techniques, Electron electron double resonance, Electron nuclear double resonance, *Trapped electrons, Trapped particles.

This is a final report of research designed to extend the knowledge of production, storage and utilization of highly energetic chemical species. The research concentrated on the physical and chemical properties of radiation-produced ions trapped in solid matrices. The first definitive and comprehensive picture of trapped electron energy levels in glassy matrices extending over a broad range of polarity has been obtained from both experimental and theoretical studies. Mobility measurements of electrons in conduction states of glassy matrices have allowed the identification of the dominant electron scattering mechanisms. New methods involving electron-electron double resonance have been developed to study magnetic energy transfer between ions and radicals in disordered solids. The spatial correlation between cations and electrons produced by photoionization has been demonstrated to depend upon the photoionization energy. These studies lay the groundwork for characterizing the stability of ion trapping in disordered solids. Included are abstracts of 34 papers completed on this project. (Modified author abstract)

AD-781 162/3GA PC$4.00/MF$1.45
Army Foreign Science and Technology Center Charlottesville Va
GAS LIBERATION DURING LEAD AZIDE RADIOLYSIS,
S. M. Ryabykh, and Yu. A. Zakharov. 20 Sep 73, 6p Rept no. FSTC-HT-23-709-73
Trans. of Izvestiya Vysshikh Uchebnykh Zavedenii. Khimiya i Khimicheskaya Tekhnologiya (USSR) v13 n12 p1737-1739 1970.

Descriptors: *Lead azides, *Radiolysis, *Nitrogen, X rays, Surfaces, Gas generating systems, Translations, USSR, Temperature, Rates.
Identifiers: Surface area.

Gas evolution of lead azide upon irradiation with an absorbed dose of 4.3 x 10 to the 16th power ev/g.sec in the 0-100C range at a residual pressure of .0001 mm Hg was studied. It was found that the gas evolution rate during irradiation is directly proportional to the surface area of the irradiated substance.

AEC-tr-7505 PC$7.60/MF$1.45
Joint Publications Research Service, Washington, D.C. (Usa).
THERMOCHEMISTRY OF COMPOUNDS OF RARE-EARTH AND ACTINIDE ELEMENTS.
G. A. Krestov. 1972, 253p
Translation of Termokhimiya soedinenii redkozemel'nykh i aktinoidnykh elementov, Moscow, Atomizdat, 1972.

Descriptors: (*Rare earths, *Chemistry), (*Actinides, Chemistry), Actinide compounds, Rare earth compounds, Thermodynamic properties.

For abstract, see NSA 30 01, number 00190.

AERE-R-7615 PC$3.75/MF$1.45
Ukaea Research Group, Harwell. Atomic Energy Research Establishment.
365 NM PHOTOLYSIS OF NITROUS ACID VAPOUR IN AIR.
D. H. F. Atkins, and R. A. Cox. Dec 73, 32p

Descriptors: (*Nitrous acid, *Photolysis), Air, Chemical analysis, Environment, Luminescence, Mixtures, Stability.

For abstract, see NSA 30 01, number 02270.

COO-3276-12(74) PC$4.00/MF$1.45
Johns Hopkins Univ., Baltimore, MD. (Usa). Dept. Of Biochemistry.
ULTRAVIOLET IRRADIATION OF NUCLEIC ACIDS AND RELATED COMPOUNDS. PROGRESS REPORT, JULY 1, 1973--JUNE 30, 1974.
S. Y. Wang. 1974, 8p
Contract AT(11-1)-3276

Descriptors: (*Nucleic acids, *Chemical radiation effects), Biology, Cytosine, Dimerization, Dimers, Gamma radiation, Hydrates, Near ultraviolet radiation, Nucleosides, Photochemistry, Photolysis, Physical radiation effects, Pyrimidines.

For abstract, see NSA 30 01, number 02296.

DPSPU-74-30-10 PC$4.00/MF$1.45
Du Pont de Nemours (E.I.) and CO., Aiken, S.C. (Usa). Savannah River Plant.
DECONTAMINATION OF A HIGHLY RADIOACTIVE CHEMICAL PROCESSING FACILITY.
P. R. Moore. 11p CONF-740406-6

Descriptors: (*Fuel reprocessing plants, *Decontamination), Cost, Hot cells, Planning, Savannah river plant, Spent fuels.

For abstract, see NSA 30 01, number 00191.

FRNC-TH-442 PC$8.25/MF$1.45
Paris-11 Univ., 91 - Orsay (France).
STUDY OF THE BEHAVIOR OF CARRIER FREE TETRAVALENT TECHNETIUM IN AQUEOUS MEDIA.
J. Y. Guennec. 1973, 104p
In French.

Descriptors: (*Technetium 99, *Radiochemistry), Anions, Aqueous solutions, Ascorbic acid, Carrier-free isotopes, Cations, Chemical properties, Chromatography, Complexes, Electrophoresis, Hydrochloric acid, Iron compounds, Isomeric nuclei, Perchloric acid, Reduction, Scintiscanning, Solvent extraction, Technetates, Technetium compounds.

For abstract, see NSA 30 01, number 00192.

ORO-4179-32 PC$4.00/MF$1.45
Texas Agricultural and Mechanical Univ., College Station (Usa). Dept. Of Chemistry.
RADIOLYTIC INVESTIGATIONS OF MICELLAR SYSTEMS. COMPREHENSIVE REPORT FOR THE PERIOD APRIL 1, 1971--MARCH 30, 1974.
J. H. Fendler. 1974, 16p
Contract AT(40-1)-4179

Descriptors: (*Water, *Radiolysis), (*Surfactants, *Chemical reactions), (*Solvated electrons, Chemical reactions), (*Hydroxyl radicals, Chemical reactions), Research programs.

For abstract, see NSA 30 01, number 00121.

ORO-4179-33 PC$4.00/MF$1.45
Texas Agricultural and Mechanical Univ., College Station (Usa). Dept. Of Chemistry.
RADIOLYTIC INVESTIGATIONS OF MICELLAR SYSTEMS. ANNUAL PROGRESS REPORT, APRIL 1, 1973--MARCH 31, 1974.
J. H. Fendler. 1974, 10p
Contract AT(40-1)-4179

Descriptors: (*Thymine, *Chemical reactions), (*Uracils, Chemical reactions), (*Solvated electrons, Chemical reactions), (*Hydroxyl radicals, Chemical reactions), Benzophenone, Photolysis, Pulsed irradiation, Pyrimidines, Quinones, Radiolysis.

For abstract, see NSA 30 01, number 00122.

PB-233 049/6GA PC$11.25/MF$1.45
Systems Applications, Inc., San Rafael, Calif.
MATHEMATICAL SIMULATION OF ATMOSPHERIC PHOTOCHEMICAL REACTIONS: MODEL DEVELOPMENT, VALIDATION, AND APPLICATION.
Final rept.,
Thomas A. Hecht, Philip M. Roth, and John H. Seinfeld. Jul 73, 164p R73-28 EPA-650/4-74-011
Contract EPA-68-02-0580

Descriptors: *Smog, *Photochemical reactions, *Atmospheric chemistry, Computerized simulation, Reaction kinetics, Air pollution, Nitrogen oxides, Alkanes, Ozone, Air quality.
Identifiers: *Chemical reaction mechanisms.

The development and evaluation of a kinetic mechanism, for use in air quality simulation models to describe photochemical smog formation, is described. The mechanism, which treats inorganic reactions in detail and organic reactions in general terms, was formulated to achieve a balance between accuracy of prediction and compactness of representation. The results of the evaluation of this mechanism using n-butane/NOx, propylene/NOx, and n-butane/propylene/NOx smog chamber data are included.

TID-26558 PC$4.25/MF$1.45
Lehigh Univ., Bethlehem, PA. (Usa). Dept. Of Physics.
ESR STUDY OF RADIATION DAMAGE IN PYRIMIDINES. TECHNICAL PROGRESS REPORT.
B. W. Benson. 3 Mar 74, 22p
Contract AT(11-1)-2367

Descriptors: (*Barbiturates, *Radiolysis), (*Radicals, *Electron spin resonance), (*Uracils, Radiolysis), Chemical reaction kinetics, Low temperature, Nitro compounds, Research programs.

For abstract, see NSA 30 01, number 00123.

8. EARTH SCIENCES AND OCEANOGRAPHY

8B. Cartography

AD-780 859/5GA PC$5.75/MF$1.45
Army Engineer Research and Development Labs Fort Belvoir Va
COMPARISON OF THE STEREOTOPOGRAPH AND THE K.E.K. PLOTTER,
William J. Locke. 15 Sep 47, 55p Rept no. AERDL-1014

Descriptors: *Stereoscopic map plotters, *Topographic maps, Aerial photographs, Photogrammetry.
Identifiers: Performance evaluation, Comparison.

The report covers the tests and investigations conducted by the Engineer Research and Development Laboratories in order to evaluate the stereotopograph as an instrument for plotting maps from aerial photographs, and to compare its accuracy with that of an improved model of the

K.E.K. plotter. Comparative tests were conducted by preparing a topographic map with each instrument and comparing the accuracy of this map with a map of the same area prepared with multiplex. Further tests on the stereotopograph to determine the maximum accuracy attainable under favorable conditions of photography and ground control were conducted. These tests consisted of plotting an area with the instrument using control data derived from a multiplex plot and comparing the resultant map with a map of the same area prepared by multiplex.

AD-781 061/7GA Not available NTIS
National Research Council of Canada Ottawa (Ontario) Photogrammetric Research Section
MAN-MACHINE PHOTOGRAMMETRIC SYSTEMS AND SYSTEM COMPONENTS,
Z. Jaksic. 4 Feb 73, 14p
Availability: Pub. in the Canadian Surveyor, v27 n4 p308-319 Dec 73.

Descriptors: *Photogrammetry, *Man machine systems, Data processing, Systems engineering, Canada.
Identifiers: Data processing systems, Automatic mapping.

Under the influence of ideas from control and communication theory, new trends have developed in the design of photogrammetric data-processing systems. In this paper a number of concepts applied to the design of such systems are discussed, with emphasis on the digital man-machine systems and system components. The main characteristics of contemporary photogrammetric systems are outlined in regard to both their hardward and software, including some remarks on automation and orthophoto-techniques. The general descriptions are supported by examples from two systems: one predominantly digital and the other predominantly analog. These examples concern the instrumental developments in the Photogrammetric Research Laboratories of the National Research Council of Canada. (Author)

AD-781 152/4GA PC$4.00/MF$1.45
Army Foreign Science and Technology Center Charlottesville Va
DEVICE FOR ENTERING POINTS ON AERIAL PHOTOGRAPHS (PRIBOR DLYA MARKIROVANIYA TOCHEK NA AEROSNIMKAKH),
I.. B. Ilin, and M. M. Boyarov. 15 Oct 72, 6p Rept no. FSTC-HT-23-26-73
Trans. of Geodeziya i Kartografiya (USSR) n8 p42-44 1969.

Descriptors: *Photogrammetry, *Aerial photographs, Alignment, Mapping, Automatic, Translations, USSR.

E74-10518 PC$6.25/MF$1.45
Centre National de la Recherche Scientifique, Toulouse (France). Service de la Carte de la Vegetation.
MANAGEMENT OF NATURAL RESOURCES THROUGH AUTOMATIC CARTOGRAPHIC INVENTORY.
Rept. no. 6 (Final), Aug 72-Jan 74,
Paul-Augustin Rey, Yves Gourinard, and Francis Cambou. May 74, 64p Rept-6 NASA-CR-138268
Original contains color imagery. Original photography may be purchased from the EROS Data Center, 10th and Dakota Ave., Sioux Falls, S.D. 57198.

Descriptors: Multispectral photography, Photointerpretation, Mapping, Data processing, Vegetation growth, Topography, Earth resources program, Spaceborne photography, Correlation detection, Geology, Urban development.

The author has identified the following significant results. Significant correspondence codes relating ERTS imagery to ground truth from vegetation and geology maps have been established. The use of color equidensity and color composite methods for selecting zones of equal densitometric value on ERTS imagery was perfected. Primary interest of temporal color composite is stressed. A chain of transfer operations from ERTS imagery to the automatic mapping of natural resources was developed.

8C. Dynamic Oceanography

AD-781 016/1GA Reprint
Massachusetts Inst of Tech Cambridge Dept of Earth and Planetary Sciences
INCIPIENT SEDIMENT MOVEMENT BY SHOALING INTERNAL GRAVITY WAVES,
David A. Cacchione, and John B. Southard. 7 Mar 74, 9p
Contract N00014-67-A-0204-0048
Revision of report dated 3 Jan 73.
Availability: Pub. in Jnl. of Geophysical Research, v79 n15 p2237-2242, 20 May 74.

Descriptors: *Ocean waves, *Sediment transport, Internal waves, Ocean bottom, Boundary layer, Correlation techniques, Particle size, Continental shelves, Gravity waves.
Identifiers: Internal gravity waves.

Internal waves propagating in a linearly stratified medium over a planar slope show strong amplification of near-bottom velocities. The authors developed a criterion for incipient movement of bottom sediment by shoaling internal waves by equating moments due to fluid force and gravity force acting on an exposed bed particle. Comparison of predicted conditions of incipient sediment movement with mean sediment sizes actually present on the continental shelf and continental slope southeast of New England indicates that shoreward propagation of relatively high frequency small amplitude waves, with frequencies and amplitudes within the range known to be present in the oceans, would move sizes of bottom sediment present on the shelf and possibly also on the slope. (Modified author abstract)

COM-74-11146/9GA PC$4.00/MF$1.45
National Oceanographic Instrumentation Center, Washington, D.C.
CURRENT METER FIELD EVALUATION.
Mar 72, 10p Technical Bull-RN-1006 NOAA-74051642

Descriptors: *Flowmeters, *Ocean currents, Performance evaluation, Field tests, Correlation techniques, Reliability(Electronics).
Identifiers: *Oceanographic equipment.

Between the months of April and October 1970, the Testing Division of the National Oceanographic Instrumentation Center conducted field evaluation tests on several types of ocean current meters. The program included both basic evaluations to determine instrument operational capability along with other tests intended to investigate more specific properties of the current meters. The evaluations were made on three different types of current meters: Hydro Products Model 502 (two instruments), the EG and G Model A850 (two instruments), and the Marine Advisers Model A-15 (one instrument). Information in this bulletin is given on general performance in-situ of each model and a comparison of instrument output data is presented.

COM-74-11148/5GA PC$4.00/MF$1.45
National Oceanographic Instrumentation Center, Washington, D.C.
ELECTROMAGNETIC CURRENT METER EVALUATION.
Mar 74, 14p Technical Bull-RN-1009 NOAA-74051645

Descriptors: *Ocean currents, *Measuring instruments, Electromagnetic induction, Design, Performance evaluation, Specifications, Electrical properties, Tolerances(Mechanics), Environmental tests.
Identifiers: *Oceanographic equipment.

The technical bulletin reports the results of a recent study on electromagnetic current meters. The work was done by the evaluation branch of the center's testing division between 1971 and 1973. The similarity of electromagnetic current meters ends with the principle of operation and differs in the design of the transducer shape, electromagnet configuration and driving signal, and signal-conditioning electronics. Details are given on instrument and performance characteristics and magnetic and hydrodynamic field configurations are illustrated.

COM-74-11156/8GA PC$4.00/MF$1.45
National Oceanographic Instrumentation Center, Washington, D.C.
MODEL A850 MAGNETIC TAPE RECORDING CURRENT METER. GEODYNE CORPORATION, WALTHAM, MASSACHUSETTS 02154.
Instrument fact sheet.
Mar 71, 9p IFS-71011 NOAA-74051632

Descriptors: *Measuring instruments, *Magnetic recording, *Ocean currents, Specifications, Performance evaluation, Design, Electrical properties, Tolerances(Mechanics), Environmental tests.
Identifiers: *Oceanographic equipment.

The Geodyne Model A850 Magnetic Tape Recording Current Meter is designed to measure water current speed in the range between 0.05 and 7 knots and current direction to subsurface levels equivalent to 8000 psi, that is, 16,400 feet (respectively 562.5 kg/sq cm or 5000 meters). These measurements are recorded in serial binary form on a self-contained, closed-loop magnetic tape. Following a tabulation of the manufacturer's performance specifications, information is given on the performance tests made in the Instrumentation Center.

COM-74-11162/6GA PC$4.00/MF$1.45
National Oceanographic Instrumentation Center, Washington, D.C.
VECTOR AVERAGING CURRENT METER. AMF INC., ALEXANDRIA, VA. 22314.
Instrument fact sheet.
Apr 74, 13p IFS-74008 NOAA-74051624

Descriptors: *Flowmeters, *Ocean currents, Specifications, Design, Environmental tests, Tolerances(Mechanics), Service life, Calibrating, Dynamic response, Acceptability.
Identifiers: *Oceanographic equipment.

The Vector Averaging Current Meter (VACM) is a Savonius rotor/vane/magnetic compass-type instrument designed to achieve rapid data sampling and long-term operation for the measurement of ocean currents. Following a tabulation of the manufacturer's performance specifications, information is given on the performance tests made in the Instrumentation Center.

COM-74-11164/2GA PC$4.00/MF$1.45
National Oceanographic Instrumentation Center, Washington, D.C.
MODEL 502 IN-SITU CURRENT SPEED, CURRENT DIRECTION, AND TEMPERATURE RECORDING SYSTEM. DILLINGHAM CORPORATION, HYDRO PRODUCTS DIVISION, SAN DIEGO, CALIFORNIA. 92112.
Instrument fact sheet.
Nov 70, 14p IFS-71004 NOAA-74051626

Descriptors: *Ocean currents, *Flowmeters, *Temperature measuring instrument, Specifications, Design, Performance evaluation, Electrical properties, Tolerances(Mechanics), Environmental tests.
Identifiers: *Oceanographic equipment.

The Hydro Products Model 502 In-Situ Current Speed, Current Direction, and Temperature Recording System is a self-contained instrument

package for measurement of water current speed, direction, and temperature in oceans, lakes, and rivers and is intended for operation to depths of 10,000 feet (3050 meters). Following a tabulation of the manufacturer's performance specifications, information is given on the performance tests made in the Instrumentation Center.

COM-74-11166/7GA PC$4.00/MF$1.45
National Oceanographic Instrumentation Center, Washington, D.C.
MODEL Q-15 CURRENT METER MARINE ADVISERS, SOLANA BEACH, CALIFORNIA. 92075.
Instrument fact sheet.
Dec 70, 12p IFS-71005 NOAA-74051627

Descriptors: *Flowmeters, *Ocean currents, Design, Specifications, Performance evaluation, Electrical properties, Tolerances(Mechanics), Environmental tests.
Identifiers: *Oceanographic equipment.

The Marine Advisers Q-15 Current Meter is intended to measure ocean current speed and direction to depths of 1000 feet (approximately 300 meters) with tilt angles as great as 20 degrees in a temperature environment ranging from 0C to 30C. Following a tabulation of the manufacturer's performance specifications, information is given on the performance tests made in the Instrumentation Center.

COM-74-11175/8GA PC$4.00/MF$1.45
National Oceanographic Instrumentation Center, Washington, D.C.
MODEL 418 ALPINE WAVE METER. ALPINE GEOPHYSICAL ASSOCIATES, INC., NORWOOD, NEW JERSEY 07648.
Instrument fact sheet.
Jul 73, 12p IFS-74001 NOAA-74051617

Descriptors: *Wave recorders(Water waves), *Ocean waves, Specifications, Design, Performance evaluation, Ocean tides, Tsuanamis, Depth, Electrical properties, Tolerances(Mechanics), Environmental tests.
Identifiers: *Oceanographic equipment.

The Alpine Model 418 Wave Meter is designed to measure water wave heights, water depths, and tide and tsunami heights. The equipment comprises a solid-state electronic unit operating in conjunction with a pressure transducer using an alternating-current Wheatstone bridge that includes a strain gage as a sensing element. Following a tabulation of the manufacturer's specifications, information is given on the performance tests made in the Instrumentation Center.

COM-74-11177/4GA PC$4.00/MF$1.45
National Oceanographic Instrumentation Center, Washington, D.C.
MODEL CM-1106CD VORTEX-SHEDDING CURRENT METER, J-TEC ASSOCIATES, INC., CEDAR RAPIDS, IOWA 52401.
Instrument fact sheet.
Apr 74, 10p IFS-74007 NOAA-74051623

Descriptors: *Flowmeters, *Ocean currents, Design, Specifications, Performance evaluation, Electrical properties, Tolerances(Mechanics), Environmental tests.
Identifiers: *Oceanographic equipment.

The J-Tec Associates, Inc., Model CM-1106CD vortex current meter uses the phenomenon of vortex shedding as a means of measuring fluid speed. Following a tabulation of the manufacturer's performance specifications, information is given on the performance tests made in the Instrumentation Center.

COM-74-11178/2GA PC$4.00/MF$1.45
National Oceanographic Instrumentation Center, Washington, D.C.
MK III ELECTROMAGNETIC CURRENT METER. COMEX EQUIPMENT, MARSEILLE, FRANCE.
Instrument fact sheet.
Jul 73, 14p IFS-74002 NOAA-74051618

Descriptors: *Flowmeters, *Ocean currents, Specifications, Performance evaluation, Electrical properties, Tolerances(Mechanics), Environmental tests, Orientation, Acceptability, France.
Identifiers: *Oceanographic equipment.

The Comex MK III electromagnetic current meter senses water flow with a transducer that has no moving parts. The Comex MK III system consists of the underwater transducer, a six-conductor shielded cable connecting the transducer to a junction box, and a deck unit containing the signal conditioning electronics. Following a tabulation of the manufacturer's performance specifications, information is given on the performance tests made in the Instrumentation Center.

COM-74-11180/8GA PC$4.00/MF$1.45
National Oceanographic Instrumentation Center, Washington, D.C.
MODEL 9010 WAVE AND TIDE MONITOR. PLESSEY ENVIRONMENTAL SYSTEMS, SAN DIEGO, CA. 92138.
Instrument fact sheet.
Feb 74, 14p IFS-74004 NOAA-74051620

Descriptors: *Wave recorders(Water waves), *Ocean waves, *Tide gages, Monitors, Design, Specifications, Environmental tests, Performance evaluation, Tolerances(Mechanics), Electrical properties, Acceptability.
Identifiers: *Oceanographic equipment.

The Plessey Environmental Systems Model 9010 Wave and Tide Monitor consists of a wave staff with a driving oscillator and a remote electronics assembly. Following a tabulation of the manufacturer's specifications, information is given on the performance tests made in the Instrumentation Center.

COM-74-11181/6GA PC$4.00/MF$1.45
National Oceanographic Instrumentation Center, Washington, D.C.
MODEL MO. 21 RECORDING CURRENT METER. THE PLESSEY COMPANY, LTD., MARINE SYSTEMS DIVISION, ILFORD, ESSEX, ENGLAND.
Instrument fact sheet.
Jul 72, 17p IFS-73001 NOAA-74051607

Descriptors: *Flowmeters, *Ocean currents, *Stream flow, Specifications, Performance evaluation, Electrical properties, Tolerances(Mechanics), Environmental tests, Design.
Identifiers: *Oceanographic equipment.

The fact sheet reports on a current meter designed to measure the speed and direction of waterflow in oceans, lakes, and rivers. It includes a suspension frame and swivel assembly for mooring the meter at a maximum depth of 6,500 ft (2,000 m). As normally supplied, the meter is arranged to make a series of four measurements every 10 minutes. Following a tabulation of the manufacturer's performance specifications, information is given on the performance tests made in the Instrumentation Center.

COM-74-11183/2GA PC$4.00/MF$1.45
National Oceanographic Instrumentation Center, Washington, D.C.
MODEL A-2/Q-6 WAVE RECORDING SYSTEM. THE BENDIX CORPORATION, ENVIRONMENTAL SCIENCE DIVISION, BALTIMORE, MARYLAND, 21204.
Instrument fact sheet.
Aug 72, 13p IFS-73002 NOAA-74051608

Descriptors: *Wave recorders(Water waves), *Ocean waves, Specifications, Design, Electrical properties, Performance evaluation, Environmental tests, Acceptability.
Identifiers: *Oceanographic equipment.

The Bendix Corporation A-2/Q-6 Wave Recording System consists of the Model A-2 Wave Sensor and the Model Q-6 Wave Recorder. The wave sensor incorporates a strain-gage-type differential pressure transducer with mechanical-hydraulic filtering. The elements are arranged as a high-pass filter to produce an electrical output which is a function of wave height while damping response to long-period fluctuations. Following a tabulation of the manufacturer's performance specifications, information is given on the performance tests made in the Instrumentation Center.

8E. Geodesy

AD-781 138/3GA PC$6.50/MF$1.45
Informatics Inc Rockville Md
SOVIET SATELLITE GEODESY. BASIS AND STATUS OF SOVIET LASER GEODESY AND LONG-BASE LINE INTERFEROMETRY.
Interim rept.,
Stuart G. Hibben, and Eleanor M. Rowell. 15 May 74, 262p* AFOSR-TR-74-0962
Contract F44620-72-C-0053

Descriptors: *Geodesy, *USSR, State of the art, Geodetic satellites, Satellite tracking systems, Triangulation, Instrumentation, Cameras, Range finding, Laser, Radio interferometers, Frequency standards.
Identifiers: Laser range finders, Long baseline radio interferometry.

The report is a survey of Soviet developments in satellite geodesy, presented in the following sections: survey of Soviet literature; observation and tracking stations; space triangulation networks; cameras used for satellite geodesy; laser geodesy; and long-baseline interferometry. Four appendices are included.

AD-781 168/0GA PC$4.00/MF$1.45
Army Foreign Science and Technology Center Charlottesville Va
INFLUENCE OF 'PARASITIC' AMPLITUDE MODULATION IN GEODETIC PHASE RADAR RANGEFINDERS,
A. A. Genika, and M. I. Vernitskii. 1 Apr 74, 17p
Rept no. FSTC-HT-23-1559-73
Trans. of Geodeziya i Kartografiya (USSR) n7 p15-23 1972.

Descriptors: *Range finding, *Geodesy, Radar, Amplitude modulation, Translations, USSR.

'Parasitic' amplitude modulation accompanies frequency modulation of carrier oscillations in radar rangefinders. Sources of this kind of modulation in radar rangefinders are analyzed and corrective steps are recommended.

N74-22030/2GA PC$8.25/MF$1.45
Smithsonian Astrophysical Observatory, Cambridge, Mass.
EARTH'S GRAVITY FIELD TO THE EIGHTEENTH DEGREE AND GEOCENTRIC COORDINATES FOR 104 STATIONS FROM SATELLITE AND TERRESTRIAL DATA.
E. M. Gaposchkin. Apr 73, 101p NASA-CR-138160, SAO-404-065
Contract NGR-09-015-002
Subm-Prepared in Cooperation with Harvard Univ., Cambridge, Mass.

Descriptors: *Geocentric coordinates, *Geodesy, *Gravitational fields, Satellite observation, Satellite tracking, Triangulation, Wavelengths.

For abstract, see STAR 1213

N74-22057/5GA PC$4.50/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
CONTRIBUTIONS OF SATELLITE-DETERMINED GRAVITY RESULTS IN GEODESY.
M. A. Khan. Feb 74, 28p NASA-TM-X-70634, X-921-74-54
Subm-Submitted for Publication.

Descriptors: *Geodesy, *Gravitational fields, *Gravity anomalies, Geophysics, Mathematical models, Satellite orbits, Tables (Data).

For abstract, see STAR 1213

N74-22058/3GA PC$5.00/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
STRATEGIES FOR ESTIMATING THE MARINE GEOID FROM ALTIMETER DATA.
P. Argentiero, W. D. Kahn, and R. Garza-robles. Apr 74, 36p NASA-TM-X-70637, X-932-74-90
Subm-Submitted for Publication. Conf-Presented at the Natl. Spring Meeting of the AM. Geophys. Union, Washington, D. C., 8-12 Apr. 1974.

Descriptors: *Altimeters, *Geoids, *Satellite-borne instruments, Fine structure, Gravity anomalies, Ocean surface, Orthogonality, Topography.

For abstract, see STAR 1213

N74-22461/9GA PC$5.00/MF$1.45
Smithsonian Astrophysical Observatory, Cambridge, Mass.
THE SECOND ORDER GRAVITATIONAL REDSHIFT: TRACKING ANALYSIS STUDY.
Final Report.
J. Jaffe, and R. F. C. Vessot. Oct 73, 40p NASA-CR-138112, SAO-310-057
Contract NGR-09-015-205

Descriptors: *Gravitation theory, *Red shift, *Spacecraft tracking, Atomic clocks, Orbit perturbation, Radial velocity, Solar orbits.

For abstract, see STAR 1213

8F. Geography

AD-780 678/9GA PC$4.75/MF$1.45
Rand Corp Santa Monica Calif
A NEW TABULATION OF THE SCRIPPS TOPOGRAPHY ON A ONE-DEGREE GLOBAL GRID. PART I. TERRAIN HEIGHTS,
W. L. Gates, and A. B. Nelson. Nov 73, 140p Rept no. R-1276-ARPA
Contract DAHC15-73-C-0181, ARPA Order-189-1

Descriptors: *Topography, *Global, Terrain, Altitude, Tables(Data), Statistical data.

A revision and retabulation of world-wide terrain height data originally prepared at the Scripps Institution of Oceanography. Revisions to the original data include the insertion of the elevation of the surface of lakes, the negative elevation of land areas lying below sea level, and the elevation of heretofore omitted islands. A number of errors have also been corrected, and changes made in the land elevation near coasts. The newly formatted global 1-deg tabulations of terrain data are supplemented by a global analysis, frequency histograms, and zonal averages. (Author)

JPRS-62180 PC$3.00/MF$1.45
Joint Publications Research Service, Arlington, Va.
BASIC PROBLEMS OF ANTARCTICA EXPLOITATION,
S. B. Slevich. 6 Jun 74, 31p
Trans. of mono. Osnovnye Problemy Osvoeniya Antarktiki, Leningrad, Jun 73 pl-32.

Descriptors: *Antarctic regions, *Exploitation, *Exploration, Natural resources, Marine biology, Land use, Military operations, Translations, USSR.

The report contains a discussion of the Antarctica and problems connected with its development and exploration.

N74-22026/0GA PC$10.50/MF$1.45
Cornell Univ., Ithaca, N.Y.
REMOTE SENSING PROGRAM.
Semiannual Status Report, 1 Jun. - 30 Nov. 1973.
T. Liang. 27 Dec 73, 150p NASA-CR-138135
Contract NGL-33-010-171

Descriptors: *Aerial photography, *Mapping, *Remote sensors, *Resources management, Data acquisition, Data processing, Earth resources, Environment pollution, Mapping.

For abstract, see STAR 1213

N74-22047/6GA PC$8.00/MF$1.45
Kansas Univ. Center for Research, Inc., Lawrence. Space Technology Center.
RESEARCH ON THE APPLICATION OF SATELLITE REMOTE SENSING TO LOCAL, STATE, REGIONAL AND NATIONAL PROGRAMS INVOLVED WITH RESOURCE MANAGEMENT AND ENVIRONMENTAL QUALITY.
Annual Report, 1 Apr. 1972 - 30 Mar. 1974.
B. G. Barr. Apr 74, 98p NASA-CR-138173
Contract NGL-17-004-024

Descriptors: *Remote sensors, *Technology utilization, *University program, Agriculture, Earth resources technology satellites, Kansas, Skylab program.

For abstract, see STAR 1213

N74-22070/8GA PC$9.25/MF$1.45
Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt, Oberpfaffenhofen (West Germany). Abteilung Extraterrestrische Sensortechnik.
STUDY FOR A GEOSCIENTIFIC AIRCRAFT MEASUREMENT PROGRAM STUDIE FUER EIN ERDWISSENSCHAFTLICHES FLUGZEUGMESSPROGRAMM.
A. Rossbach, and M. Schroeder. Feb 73, 125p
Language in German.

Descriptors: *Earth environment, *Earth resources survey aircraft, *Germany, *Remote sensors, Aerial photography, Data processing, Do-28 'aircraft, Ecology, Environment pollution, Flight plans , Geophysics, Imaging techniques, Meteorology, Multispectral photography, Project management.

For abstract, see STAR 1213

N74-22608/5GA PC$6.75/MF$1.45
Environmental Research Inst. of Michigan, Ann Arbor. Infrared and Optics Div.
SIGNATURE EXTENSION: AN APPROACH TO OPERATIONAL MULTISPECTRAL SURVEYS.
R. F. Nalepka, and J. P. Morgenstern. Mar 73, 75p NASA-CR-134254, ERIN-31650-152-T
Contract NAS9-9784

Descriptors: *Multispectral band scanners, *Resources management, *Signature analysis, *Spectral signatures, Data correlation, Data processing, Numerical control.

For abstract, see STAR 1213

8G. Geology and Mineralogy

AD-780 669/8GA PC$4.00/MF$1.45
Defense Mapping Agency Aerospace Center St Louis Air Force Station Mo Technical Translation Section
SOME QUESTIONS OF GLACIO-ISOSTASY (NEKOTORYE VOPROSY GLYATSIOIZOSTAZII),
A. F. Grachev. Apr 74, 13p Rept no. DMAAC-TC-2019
Trans. of mono. Izostaziya (Isostasy), Moscow, 1973 p152-157, by George Synenko.

Descriptors: *Isostatic change, *Canada, Glaciers, Earth crust, Translations, USSR.

The paper discusses the process of glacio-isostatic movements of the earth's crust. Canada is an ideal area for such an analysis. The post-glacial uplift of the Canadian shield occurred against the background of the eustatic rise of the World Ocean's level, caused by melting of ice sheets. This made it necessary to introduce a corresponding correction in order to obtain a clear structural expression of the process of uplift. Charts depicting various facets of this post glacial uplift are shown. (Author)

CEA-N-1677 PC$6.75/MF$1.45
Cea Centre d'Etudes Nucleaires de Saclay, 91 - Gif-sur-Yvette (France). Service d'Electronique Physique.
THERMAL ANNEALING OF FISSION TRACKS IN MUSCOVITE MICA: GEOCHRONOLOGICAL CONSEQUENCES.
U. Pereira de Brito. Dec 73, 72p
In French.

Descriptors: (*Muscovite, Age estimation), (*Particle tracks, *Stability), (*Age estimation, Particle tracks), Annealing, Corrections, Diagrams, Dielectric track detectors, Etching, Fission fragments, Reaction kinetics, Temperature dependence, Time dependence.

For abstract, see NSA 30 01, number 00313.

E74-10520 PC$4.00/MF$1.45
Rockwell International Corp., Thousand Oaks, Calif. Science Center.
IDENTIFICATION AND INTERPRETATION OF TECTONIC FEATURES FROM ERTS-1 IMAGERY.
Progress rept. 1 Apr-31 May 74,
Monem Abdel-Gawad. 4 Jun 74, 2p SC543.12PR
NASA-CR-138269
Contract NAS5-21767

Descriptors: Tectonics, Geological faults, Photo interpretation, Sierra Nevada Mountains(CA), Earth resources program, Structural properties(Geology), Models.

The author has identified the following significant results. The transverse faults observed in the central Coast Ranges of California are believed to represent the remnants of a major system of shear faults older than the San Andreas system. The transverse shear system is believed to have developed in the Mesozoic when the Pacific Plate was advancing under the North American Plate. Shear faults thus developed due to unequal rates of underthrusting. This tectonic model indicates that the intrusive belt of the proto-Sierra Nevada and the belt of eugeosynclinal sedimentary belt (Franciscan group) which lay to the west were both subjected to regional left-handed shear. Later development of the San Andreas system as transform faults of the East Pacific Rise changed the tectonic style to right-lateral tangential. The model explains the peculiar distribution of the Franciscan rocks in the Diablo Range east of the San Andreas fault and in Santa Lucia Range west of the Nacimiento fault and the presence of Sierra Nevada type granitic blocks in between the two faults in the Salinia block. This model is also consistent with an analysis of the Texas and Parras shears which indicates that the southwestern part of North America has been subjected to a major left-lateral regional shear before the development of the San Andreas fault system.

JPRS-62095 PC$3.25/MF$1.45
Joint Publications Research Service, Arlington, Va.
GEOLOGICAL STRUCTURE AND OIL AND GAS IN THE ARCTIC,
B. A. Sokolov, A. G. Gainanov, D. V. Nesmeyanov, and A. M. Seregin. 28 May 74, 27p
Trans. of mono. Neftegazonosnost Morei i Okeanov, n.p., 1973 p194-217.

Descriptors: *Geologic structures, *Artic Ocean, Geophysical surveys, Ocean bottom topography, Fossil fuel deposits, Natural gas, Translations, USSR.

The report contains a discussion of the geological structure as it relates to oil and gas in the Arctic.

N74-22031/0GA PC$4.00/MF$1.45
Scientific Translation Service, Santa Barbara, Calif.
VECTOR DIAGRAM OF THE CHEMICAL COMPOSITIONS OF TEKTITES AND EARTH LAVAS.
L. G. Kvasha, and G. S. Gorshkov. Dec 73, 16p
NASA-TT-F-14793
Contract NASW-2483
Tran-Transl. Into English from Meteoritika (Moscow), V. 20, 1961 p 193-203.

Descriptors: *Chemical composition, *Igneous rocks, *Lava, *Tektites, *Vector analysis, Bibliographies, Photochemical reactions, Tables (Data).

For abstract, see STAR 1213

N74-22048/4GA PC$4.00/MF$1.45
Scientific Translation Service, Santa Barbara, Calif.
THE ASSOCIATION OF CERTAIN PROPERTIES OF RELIEF OF SOUTHEAST FERGAN WITH FRACTURING.
N. G. Utkina. Sep 73, 13p NASA-TT-F-14753
Contract NASW-2483
Tran-Transl. Into English from the Book "Materialy Po Geologii Kaynozoya I Noveyshey Tektonike Tyan-Shanya" Ilim Press, Frunze, 1970 p 172-181.

Descriptors: *Fracturing, *Geological faults, *Orography, *Terrain analysis, Maps, Tectonics, U.s.s.r..

For abstract, see STAR 1213

N74-22049/2GA PC$7.00/MF$1.45
Environmental Research Inst. of Michigan, Ann Arbor. Infrared and Optics Div.
IMPROVEMENTS IN ESTIMATING PROPORTIONS OF OBJECTS FROM MULTISPECTRAL DATA.
Technical Report, 1 Feb. 1973 - 31 Jan. 1974.
H. M. Horwitz, P. D. Hyde, and W. Richardson. Apr 74, 76p NASA-CR-134252, ERIM-190100-25-T
Contract NAS9-9784

Descriptors: *Multispectral band scanners, *Remote sensors, Algorithms, Earth resources technology satellites, Mathematical models, Signature analysis.

For abstract, see STAR 1213

N74-22051/8GA PC$10.00/MF$1.45
Environmental Research Inst. of Michigan, Ann Arbor. Infrared and Oprics Div.
THE NASA EARTH RESOURCES SPECTRAL INFORMATION SYSTEM: A DATA COMPILATION, SECOND SUPPLEMENT.
R. K. Vincent. Apr 73, 140p NASA-CR-134267, ERIM-31650-156-T
Contract NAS9-9784

Descriptors: *Earth resources information system, *Spectral signatures, Catalogs (Publications), Graphs (Charts), Minerals, Remote sensors, Rocks.

For abstract, see STAR 1213

N74-22108/6GA PC$4.25/MF$1.45
Techtran Corp., Silver Spring, Md.
METHOD AND EXAMPLE OF STUDYING AERIAL PHOTOGRAPHS OF THE NAUTRAL FRACTURING OF CARBONATES.
P. Bouche, and M. Poulet. Mar 73, 25p NASA-TT-F-14730
Contract NASW-2485
Tran-Transl. Into English from Rev. Inst. Franc. Petrole (Paris), Vol. 26, No. 1, 1971 p 1-21.

Descriptors: *Carbonates, *Fracturing, *Photointerpretation, Aerial photography, Algeria.

For abstract, see STAR 1213

N74-22439/5GA PC$4.75/MF$1.45
Grambling Coll., La. Dept. of Chemistry.
THEORETICAL INVESTIGATION OF ISOTOPIC ANOMALY OF XENON IN CARBONACEOUS CHONDRITES AND OTHER TERRESTRIAL AND EXTRA-TERRESTRIAL SAMPLES.
Semiannual Status Report.
D. D. Sabu. 15 Mar 74, 35p NASA-CR-138139
Contract NGR-19-011-012

Descriptors: *Abnormalities, *Carbonaceous meteorites, *Chemical composition, *Xenon isotopes, Chemical analysis, Chondrites, Fractionation, Solar wind.

For abstract, see STAR 1213

N74-22479/1GA PC$4.50/MF$1.45
Smithsonian Astrophysical Observatory, Cambridge, Mass.
SKYLAB SHORT-LIVED EVENT ALERT PROGRAM.
Final Report.
R. A. Citron. Feb 74, 30p NASA-CR-134262
Contract NAS9-13474

Descriptors: *Remote sensors, *Skylab program, *Spaceborne photography, Earth movements, Geological surveys, Ground truth, Volcanoes.

For abstract, see STAR 1213

PB-232 763/3GA PC$3.25/MF$1.45
Geological Survey, Doraville, Ga. Water Resources Div.
STRATIGRAPHY OF AN ARCHEOLOGICAL SITE, OCMULGEE FLOOD PLAIN, MACON, GEORGIA.
Water-resources investigations (Final),
Oliver J. Cosner. Nov 73, 35p USGS/WRI-54-73, USGS-WRD-74-012

Descriptors: *Stratigraphy, *Ocmulgee River, *Flood plains, *Archaeology, Sediments, Sand, Clay, Mineralogy, Georgia.

Archeological excavations on the Ocmulgee River flood plain at Ocmulgee National Monument revealed eight sedimentary units of Holocene age. Types of deposits found are natural levee, oberbank deposit, and a probable point bar. Since the 18th century, locally more than 10 feet of sediment has been deposited. These modern sediments are similar to those on other flood plains in the southeastern United States and probably resulted from erosion that began when extensive areas were laid bare for farming. They are red to reddish brown in contrast to underlying sediment, which is various shades of gray, brown, and yellow. Earliest traces of man are 'spinner-type' projectiles in the lower sand member (Q1s). Marrow mountain-type points are found in mottled silty sandy clay (Qmssc). Triangular stemmed Savannah River points were found throughout the intermediate sand (Qis). Fiber tempered pottery shards and steatite bowls were found in upper one half of the intermediate sand member (Qis).

PB-233 124/7GA PC$3.25/MF$1.45
Hawaii Univ., Honolulu. Water Resources Research Center.
NEUTRON WELL LOGGING IN HAWAII.
Technical rept.,
Frank L. Peterson. Feb 74, 47p TR-75 W74-09053, OWRR-A-032-HI(2)
Contract DI-14-31-0001-3511

Descriptors: *Well logging, *Hawaii, Aquifers, Permeability, Porosity, Basalt, Water wells.

The primary objective was to apply neutron logging techniques to the problem of obtaining reliable porosity data and relating these to water yields from Hawaiian aquifers. Neutron well logging in Hawaiian basaltic formations has produced much important qualitative and quantitative information. The most important application has been the determination of porosity in the saturated zones. Interpretation of neutron log responses in Hawaiian basaltic formations is similar to conventional neutron log interpretation in sedimentary formations. Neutron count varies as an inverse function of porosity. High neutron counts are indicative of low porosities and low neutron counts are indicative of high porosities. In general, the neutron logs are extremely responsive to detailed changes in formation porosity, and of particular importance is that the reproducibility of neutron logs from the same well is excellent. Neutron logs from Hawaiian wells also are extremely responsive to the saturated-unsaturated boundary and to the casing termination. Surprisingly, the neutron logs show little consistent response to nominal hole diameter or borehole fluid salinity. (Modified author abstract)

PB-233 156/9GA PC$11.25/MF$1.45
Pennsylvania Dept. of Transportation, Harrisburg. Bureau of Materials, Testing and Research.
SHALE SUITABILITY.
Final rept. on Phase 2,
David R. Reidenouer, Earl G. Geiger, Jr., and Richard H. Howe. Apr 74, 162p 2, PDT-68-23
See also PB-206 850.

Descriptors: *Shales, *Construction materials, *Roads, Durability, Degradation, Weat resistance, Weathering, Laminates, Tests, Absorption, Ethylene glycol, Petrography, Pennsylvania.
Identifiers: Aggregates(Materials).

From 1968 to 1973, an extensive study was made of many shale-like rocks from Pennsylvania in order to develop a material specification which would define suitable shales and allow their use in appropriate types of construction. A total of 124 samples were subjected to a wide variety of physical, chemical, and petrographic analysis. Graphical and statistical analysis of the data revealed that the ultrasonic disaggregation test, developed in this study, is the most sensitive indicator of shale durability. This test method could be set up easily in a central laboratory. A simple classification system of argillaceous rocks is presented. It encompasses the range of rocks sampled that are shale-like in either appearance of composition. A two-part test procedure was developed for rapid acceptance or rejection of shales in the field. The adoption of the proposed field test will make possible the use of lower-cost shale aggregate in areas where high quality aggregate is not available or is uneconomical. (Modified author abstract)

PB-233 181/7GA PC$13.50/MF$1.45
Wisconsin Univ., Milwaukee. Dept. of Geological Sciences.

EFFECTS OF ALTERATION AND JOINT FILLINGS ON THE MECHANICAL BEHAVIOR OF ROCKS. 1.
Annual rept., 1972-73,
Howard J. Pincus, and Robert A. Wipf. 31 May 73, 206p BuMines-OFR-29(1)-74
Grant G0122066
See also Part 2, PB-233 182.

Descriptors: *Rock mechanics, *Compression tests, Failure, Joints(Junctions), Fractures(Materials), Granite, Porphyry, Quartz, Monzonite, Schist, Texture, Porosity, Fillers, Gneiss, Rhyolite, Correlation techniques, Hardness, Mines(Excavations), Colorado, Arizona.
Identifiers: San Manuel Mine, Climax Mine, Henderson Mine.

The purpose of this study was to investigate the effects of fracture filling and associated alteration on the mechanical behavior of rocks. Results are presented for specimens from the Climax and Henderson mines in Colorado and the San Manuel mine in Arizona. The rock types studied from each location were from (1) Climax; medium-grained granite, fine-grained granite, granite porphyry, schist, and gneiss; (2) Henderson, rhyolite porphyry; (3) San Manuel, quartz monzonite and quartz monzonite porphyry. A description of the rocks was made including color, texture, mineral composition, composition and fabric of fracture fillings, density and porosity. Unconfined and triaxial compression tests were run on the Climax and San Manuel specimens. Sonic velocities were measured during the compression tests. (Modified author abstract)

PB-233 182/5GA PC$7.50/MF$1.45
Wisconsin Univ., Milwaukee. Dept. of Geological Sciences.
EFFECTS OF ALTERATION AND JOINT FILLINGS ON THE MECHANICAL BEHAVIOR OF ROCKS. 2.
Final rept. 1973-74,
Howard J. Pincus, and V. E. Ruzhentsev. 31 Jan 74, 89p BuMines-OFR-29(2)-74
Grant G0122066
See also Part 1, PB-233 181.

Descriptors: *Rock mechanics, *Compressive strength, Fractures(Materials), Correlation techniques, Dynamic modulus of elasticity, Sonic tests, Failure, Hardness, Porosity, Texture, Fillers, Schist, Gneiss, Granite, Joints(Junctions), Mines(Excavations), Colorado.
Identifiers: Climax Mine.

In the final report, experimental results are presented from 98 specimens from the Climax mine in Colorado. The earlier annual report gave results from tests on specimens from the Henderson mine in Colorado and the San Manuel mine in Arizona. The research disclosed that the properties and features that had some relations to compressive strength were: Young's modulus, sonic velocity, slope of the velocity curve, density, Shore scelerscope hardness, apparent porosity, rock composition, texture, extent of failure on fracture fillings and lineations, and composition of failure on fracture fillings and veinlets. Texture and extent of failure along a fracture filling or lineation appeared to be related to compressive strength for the schist, gneiss, and fine-grained granite from the Climax mine.

PB-233 208/8GA PC-GPO/MF$1.45-NTIS
Bureau of Mines, Washington, D.C.
MINERAL RESOURCES OF THE TRANS-ALASKA PIPELINE CORRIDOR.
Information circular,
John J. Mulligan. May 74, 65p BuMines-IC-8626
Prepared by Alaska Field Operation Center, Juneau.
Paper copy available from GPO $3.10 as stock no. SN2404-01558, I28.27:8626.

Descriptors: *Mineral deposits, *Alaska, Pipelines, Right of way acquisition, Environmental surveys.
Identifiers: Trans Alaska pipeline.

Reports of mineral deposits within 10 miles of the route of the proposed pipeline from Prudhoe Bay to Valdez were investigated. No producing lode deposits or lode prospects of possible national economic significance were found. Measured placer deposits crossed by the pipeline are of slight value except possibly some deeply buried gold-placer deposits in the Fairbanks and Livengood Quadrangles. The pipeline corridor crosses five belts of minerals haveing potential economic value: (1) The north slope (oil, gas, oil shale, coal, phosphate); (2) the south slope of the Brooks Range (copper, gold); (3) the Livengood area (gold); (4) the Fairbanks are (gold, lead-silver, antimony); and (5) the Wrangell Mountains-Denali Copper Belt (copper-gold). The Jarvis Creek coal deposit, an eastern extension of the Nenana coalfield, is on the north side of this belt.

PB-233 217/9GA PC$11.00/MF$1.45
Geological Survey, Menlo Park, Calif.
INDEX OF METALLIC MINERAL DEPOSITS OF ALASKA COMPILED FROM PUBLISHED REPORTS OF FEDERAL AND STATE AGENCIES THROUGH 1972.
Final rept.,
Edward H. Cobb. 1974, 594p* USGS-GD-74-022

Descriptors: *Metalliferous mineral deposits, *Bibliographies, *Alaska, Indexes(Documentation), Sites, Commodities.

The report lists references from Federal and State of Alaska published reports to the approximately 3500 deposits of metallic minerals in Alaska that are described in the approximately 750 reference in the bibliography. Data are listed by quadrangles of the Alaska Topographic Series (One inch approximately equals four miles) and include the location of each deposit and the metallic mineral commodities present.

TT-73-58005 PC$3.00/MF$1.45
Geological Survey, Reston, Va.
APPLICATION OF SOLID STATE MECHANICS TO A JOINTED HARD ROCK MASS (VOPROSY PRIMENENIYA MEKHANIKI SPLOZHNYKH SRED K TRESHCHINOVATYM SKALYM MASSIVAM),
B. V. Gusev, and L. S. Lapidus. 1974, 7p
Trans. from Vsesoyuznaya Nauchnaya Konferentsiya po Mekhanike Gornykh Porod (1st). Materialy, Alma Ata, 1966. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: *Rock mechanics, Numerical analysis, Translations, USSR.

The article deals with an approach toward a definition of the criterion of quasi-homogeneity, i.e. the degree of jointing above which solid mechanics can be applied and below which the discreet medium theory can be used.

8H. Hydrology and Limnology

BMI-171-153 PC$5.00/MF$1.45
Battelle Columbus Labs., Ohio (Usa).
AMCHITKA BIOENVIRONMENTAL PROGRAM. LIMNOLOGY OF AMCHITKA ISLAND, ALASKA. FINAL SUMMARY REPORT AND PROGRESS REPORT, JULY 1, 1972--SEPTEMBER 30, 1973.
R. D. Burkett. Mar 74, 38p
Contract AT(26-1)-171

Descriptors: (*Amchitka island area, *Limnology), (*Aquatic ecosystems, *Seismic effects), (*Cannikin event, *Ground motion), (*Milrow event, Ground motion), Lakes, Plankton, Production, Quantitative chemical analysis, Surface waters.

For abstract, see NSA 30 01, number 00327.

BNWL-SA-3204 PC$3.25/MF$1.45
Battelle Pacific Northwest Labs., Richland, Wash. (Usa).
DYE STUDIES THROUGH USE OF ADVANCEMENTS IN AN AERIAL OPTICAL MECHANICAL IMAGING SYSTEM.
J. R. Eliason, and H. P. Foote. Apr 70, 21p CONF-700348-1
Contract AT(45-1)-1830

Descriptors: (*Surface waters, *Flow rate), (*Rivers, Flow rate), (*Image converters, *Design), Aircraft, Data processing, Display devices, Electromagnetic radiation, Fluorescein, Images, Tracer techniques.

For abstract, see NSA 30 01, number 02388.

BNWL-1719 PC$5.45/MF$1.45
Battelle Pacific Northwest Labs., Richland, Wash. (Usa).
EXPERIMENTAL SUPPORT STUDIES FOR THE PERCOL AND TRANSPORT MODELS.
R. C. Routson, and R. J. Serne. 1972, 77p
Contract AT(45-1)-1830

Descriptors: (*Soils, *Chemical reactions), (*Ground water, *Contamination), (*Europium, *Adsorption), (*Strontium, Adsorption), Data, Hapo, Ion exchange, Mathematical models, P codes, Radioactive wastes, Radiocolloids, Radioisotopes, Radionuclide migration, Sorptive properties.

For abstract, see NSA 30 01, number 00303.

EUR-5052 PC$6.50/MF$1.45
Commission of the European Communities, Luxembourg; Commission of the European Communities, Ispra (Italy). Joint Nuclear Research Center.
CALCULATED DISTRIBUTION OF THE CHEMICAL SPECIES OF COPPER, ZINC, CADMIUM, AND LEAD IN 16 LAKES OF NORTHERN ITALY.
M. F. Baudouin, and P. Scoppa. Feb 74, 88p

Descriptors: (*Copper, *Distribution), (*Zinc, Distribution), (*Cadmium, Distribution), (*Lead, Distribution), Chemical analysis, Fresh water, Interactions, Italy, Lakes, Mathematical models, Ph value.

For abstract, see NSA 30 01, number 02277.

E74-10546 PC$4.00/MF$1.45
National Environmental Satellite Service, Washington, D.C.
EVALUATION OF ERTS DATA FOR CERTAIN OCEANOGRAPHIC USES.
Bimonthly rept. nos. 11/12, Jan-Apr 74,
Alan E. Strong. Apr 74, 4p NASA-CR-138295
Contract NASA Order S-70246-AG

Descriptors: Lake Michigan, Calcium carbonates, Precipitation(Chemistry), Lake Erie, Lake Ontario, Earth resources program, Carbon dioxide, Upwelling water, Oceanography.

The author has identified the following significant results. According to Lake Michigan records, the pH levels have been steadily increasing as the lake becomes more eutrophic. Numerous upwellings during the summer of 1973, beginning with the late July event, appear to be triggering a chemical precipitation of calcium carbonate. The upwelling provides abundant carbon dioxide into the surface water and results in massive blooms of phytoplankton. As the CO2 is used by these microscopic plants the pH is increased (acidity decreases) and CaCO3 no longer is able to remain in solution. The precipitation takes place where the phytoplankton are living, near depths of 10 meters. Therefore, the whiting observed by ERTS-1 is only seen in the green band, as red cannot penetrate but a few meters. With these whitings, secci disc readings lower in July from 10-15 meters to 3-5 meters and green, milky water is observed

by research vessels. It appears that whitings have been becoming more frequent since the middle 60's but until ERTS-1 the extent has never been realized. Calcium levels are too low, presently, for a similar precipitate in Lakes Huron or Superior. However, whitings have been seen by ERTS-1 in Lakes Erie and the Ontario where the calcium ion and pH levels are more like those found in Lake Michigan.

HASL-281 and App. PC$13.60/MF$1.45
Usaec Health and Safety Lab., New York.
FALLOUT PROGRAM. QUARTERLY SUMMARY REPORT, DECEMBER 1, 1973--MARCH 1, 1974.
E. P. Jr. Hardy. 1 Apr 74, 742p

Descriptors: (*Global fallout, *Distribution), (*Stratosphere, *Radiation monitoring), (*Strontium 90, Radiation monitoring), (*Cesium 137, Radiation monitoring), Atmospheric explosions, Atmospheric precipitations, Beta sources, Bone tissues, Cerium 144, Diet, Drinking water, Fallout, Milk, New york city, Nuclear explosions, Plutonium 238, Plutonium 239, Poland, Radiation doses, Radioactivity, Radiochemical analysis, Radioecological concentration, Radionuclide kinetics, Surface air, Zirconium 95.

For abstract, see NSA 30 01, number 00295.

NRL-F-51 PC$4.75/MF$1.45
National Radiation Lab., Christchurch (New Zealand).
ENVIRONMENTAL RADIOACTIVITY. FALLOUT FROM NUCLEAR WEAPONS TESTS CONDUCTED BY FRANCE IN THE SOUTH PACIFIC DURING JULY AND AUGUST 1973 AND COMPARISONS WITH PREVIOUS TEST SERIES.
Nov 73, 33p

Descriptors: (*New zealand, Fallout), (*Fallout, *Radiation monitoring), (*Surface air, Radiation monitoring), (*Rain, Radiation monitoring), Health hazards, Iodine 131, Islands, Milk, Nuclear explosions, Pacific ocean.

For abstract, see NSA 30 01, number 00296.

PB-232 708/8GA PC$3.25/MF$1.45
Geological Survey, Menlo Park, Calif. Water Resources Div.
A WATER-QUALITY RECONNAISSANCE OF BIG BEAR LAKE, SAN BERNARDINO COUNTY, CALIFORNIA, 1972-73.
Water-resources investigations. Final rept. 1972-73,
George A. Irwin, and Michael Lemons. May 74, 47p USGS/WRI-3-74, USGS/WRD-74-014
Prepared in cooperation with California Water Resources Control Board, and Big Bear Lake Pest Abatement District.

Descriptors: *Primary biological productivity, *Big Bear Lake, California, Nutrients, Dissolved gases, Oxygen, Plankton, Seasonal variations, Temperature, Nitrites, Nitrogen organic compounds, Phosphorous inorganic acids, Water quality.
Identifiers: *Eutrophication, San Bernardino County(California), *Water quality data.

A water-qualtiy reconnaissance study of the Big Bear Lake area in southern California was made by the U.S. Geological Survey during the period April 1972 through April 1973. The primary purpose of the study was to measure seasonally the concentration and distribution of selected primary nutrients, dissolved oxygen, phytoplankton, and water temperature in the lake. In addition, measurements of the nitrogen and phosphorus loading to the lake from surface-water tributaries and precipitation were also made. Results of the study indicate that Big Bear Lake is moderately eutrophic, at least in regard to nitrogen, phosphorus, and organic content. Seasonal levels of dissolved oxygen indicated that the nutrients and other controlling factors were optimum for relatively high primary productivity.

PB-232 966/2GA PC$7.25/MF$1.45
Geological Survey, Oklahoma City, Okla. Water Resources Div.
FLOOD CHARACTERISTICS OF OKLAHOMA STREAMS. TECHNIQUES FOR CALCULATING MAGNITUDE AND FREQUENCY OF FLOODS IN OKLAHOMA, WITH COMPILATIONS OF FLOOD DATA THROUGH 1971.
Final rept.,
V. B. Sauer. Jan 74, 307p USGS-WRI-52-73, USGS/WRD-74-023
Prepared in cooperation with Oklahoma State Dept. of Highways, Oklahoma City, and Federal Highway Administration, Washington, D.C.

Descriptors: *Floods, *Streams, *Oklahoma, Surface water runoff, Probability theory, Regression analysis, Flood control, Drainage, Watersheds, Mathematical models, Precipitation(Meteorology), Seasonal variations, Sampling.

Flood magnitude for selected recurrence intervals is related to basin and climatic parameters for natural streams of less than 2,500 sq. mi., in Oklahoma by multiple regression techniques through the mathematical model, (Q sub x)=a(A to the b power)(S to the c power)(p to the d power), where Q sub x is peak discharge for recurrence interval x, A is contributing drainage area, S is main channel slope, P is mean annual precipitation, and a, b, c, and d are regression constants and coefficients. Individual relations of flood magnitude to contributing drainage area are given for parts of the main stems of the Arkansas, Cimarron, North Canadian, Canadian, Washita, North Fork Red, and Red Rivers. Graphical relations of maximum floods of record for eastern and western Oklahoma are given as a guide to maximum probable floods. A random sampling of seasonal occurrence of floods indicates about two-thirds of all annual floods in Oklahoma occur in the four month period April through July.

PB-233 123/9GA PC$4.75/MF$1.45
Geological Survey, Menlo Park, Calif.
FLASHING FLOW IN HOT WATER GEOTHERMAL WELLS: COMPUTER PROGRAM,
Manuel Nathenson. May 74, 34p USGS-GD-74-021

Descriptors: *Water wells, *Geothermy, *Computer programs, PL/1 programming language, Water flow, Steam flow, Two phase flow, Programming manuals.
Identifiers: Geothermal energy, IBM 360/65 computers.

A PL/1 computer program for calculating the production characteristics of hot water geothermal wells which flash to steam-water mixtures in the cased portion of the hole is presented. The flashing flow is assumed to be isenthalpic and, for purposes of calculating pressure drop, a finely dispersed mixture of equal average velocity. The flow in the aquifer is treated using steady radial Darcy flow. The thermodynamic properties of saturated water and steam are obtained using interpolation and a stored set of steam tables.

PB-233 138/7GA PC-GPO/MF$1.45-NTIS
Wisconsin Univ., Madison. Dept. of Soil Science.
PROTOCOL FOR EVALUATING THE NITROGEN STATUS OF LAKE SEDIMENTS.
Ecological research series rept.,
Dennis R. Keeney. Feb 74, 32p EPA-660/3-73-024, W74-09065
Grant EPA-R-801362
Paper copy available from GPO $0.65 as stock no. EP1.23:660/3-73-024.

Descriptors: *Lakes, *Sediments, *Nitrogen, Water chemistry, Nitrification, Inorganic nitrates, Nitrogen fixation, Limnology, Wisconsin.
Identifiers: Eutrophication.

The approach and methodology to evaluate the nitrogen status of lake sediments, with the ultimate aim of estimating their role as a nitrogen source or sink to the overlying waters, is outlined. The information is derived from five years of research effort on the forms, amounts and transformations of nitrogen in lake sediments. The suggested approach involves monitoring or comparative characterization, or both, of the forms of nitrogen in lake sediments, along with laboratory tests to assess the relative rates of various key nitrogen processes such as nitrification, denitrification, mineralization and immobilization.

PB-233 165/0GA PC$3.75/MF$1.45
Conservation Foundation, Washington, D.C.
HYDROGRAPHY AND BEACH DYNAMICS,
Thomas N. Lee, and Bernard J. Yokel. Nov 73, 58p W74-09059, OWRR-C-4022(9004)(3)
Study No. 4 on Rookery Bay Land Use Studies. Environmental Planning Strategies for the Development of a Mangrove Shoreline. Prepared by Rosenstiel School of Marine and Atmospheric Science, Miami, Fla.

Descriptors: Hydrography, *Rookery Bay, *Estuaries, *Florida, Ocean tides, Surface waters, Drainage, Floods, Stream flow, Salinity, Hydrographic surveys, Keewaydin Island, Little Marco Island, Mexico Gulf.
Identifiers: Tidal effects, Water levels.

Hydrologic and beach dynamics studies were conducted in and near Rookery Bay Sanctuary south of Naples on the southwest coast of Florida. These studies determined water exchange rates, tidal range variations, the characteristics of the tidal prism, bottom contours, the basin capacities and changes occurring in the geometry of the channels connecting the Sanctuary system with the Gulf of Mexico. Rookery Bay has an average depth of 3.0 feet, a mean volume of 135 million cubic feet and an effective mean tidal prism of 154 million cubic feet. Data on mean high tide levels at four stations for 23 months were presented. The changing configurations of Keewaydin and Little Marco Islands are illustrated and the implication for the Sanctuary discussed.

RD/B/M-2893 PC$5.00/MF$1.45
Central Electricity Generating Board, Berkeley (Uk). Berkeley Nuclear Labs.
BEHAVIOUR OF RADIONUCLIDES IN THE ENVIRONMENT: IMPRESSIONS OF TWO RECENT INTERNATIONAL SYMPOSIA.
H. F. Macdonald, P. J. Darley, and R. B. Pepper. Jan 74, 38p

Descriptors: (*Radionuclide migration, *Meetings), (*Ecosystems, Radionuclide migration), (*Earth atmosphere, *Contamination), (*Global fallout, *Diffusion), Animals, Environment, Gaseous wastes, Human populations, Nuclear industry, Plants, Power reactors, Radiation doses, Radiation monitoring, Radioactive wastes, Radioisotopes, Radionuclide kinetics, Soils.

For abstract, see NSA 30 01, number 00297.

SCPRI(RM)-10-1973 PC$4.00/MF$1.45
Service Central de Protection Contre les Rayonnements Ionisants, 78 - le Vesinet (France).
REPORT OF ACTIVITY, OCTOBER 1973.
1973, 18p
In French.

Descriptors: (*France, *Radiation monitoring), (*Environment, *Radioactivity), Air, Barium 140, Beryllium 7, Cattle, Cesium 137, Drinking water, Dusts, Earth atmosphere, Fishes, Food chains, Ground water, Iodine 131, Lanthanum 140, Manganese 54, Milk, Niobium 95, Plants, Radium 226, Rain, Reactor sites, Rhodium 106, Ruthenium 103, Ruthenium 106, Seawater, Strontium 90, Surface waters, Tables, Tritium, Uranium, Zirconium 95.

For abstract, see NSA 30 01, number 00292.

SCPRI(RM)-10-1973(Suppl.) PC$4.25/MF$1.45
Service Central de Protection Contre les Rayonnements Ionisants, 78 - le Vesinet (France).
ANNEX TO MONTHLY REPORT, OCTOBER 1973. DETAIL OF RESULTS OF MEASUREMENT.
1973, 23p
In French.

Descriptors: (*France, *Radiation monitoring), (*Environment, *Radioactivity).

For abstract, see NSA 30 01, number 00293.

USGS-474-178 PC$4.00/MF$1.45
Geological Survey, Lakewood, Colo. (Usa); Nevada Univ., Reno (Usa). Desert Research Inst.
USE OF HYDROCHEMISTRY FOR INTERPRETING GROUND-WATER FLOW SYSTEMS IN CENTRAL NEVADA.
G. W. Jr. Fiero, J. R. Illian, G. A. Dinwiddie, and L. J. Schroder. Apr 74, 58p
Contract AT(29-2)-474

Descriptors: (*Nevada, *Hydrology), (*Ground water, *Fluid flow), Abundance, Calcium, Chlorine, Magnesium, Quantitative chemical analysis, Silicon oxides, Sodium, Sulfur.

For abstract, see NSA 30 01, number 00329.

8I. Mining Engineering

PB-232 405/1GA PC$6.00/MF$1.45
FMC Corp., San Jose, Calif. Advanced Products Div.
IMPROVED SENSORS AND FIRE CONTROL SYSTEMS FOR MINING EQUIPMENT. PHASE I.
Contract research rept. Jun-Dec 72.
Dec 72, 234p* BuMines-OFR-25(1)-74
Contract H0122053
See also PB-232 406.

Descriptors: *Fire safety, *Mining equipment, *Trucks, *Fire detection systems, Fire extinguishers, Mine haulage, Fire protection.

The report concludes that trucks of capacity in excess of 50 tons represent the greatest potential for fire and that efforts to provide fire protection systems against B class (flaming liquid) and C class (electrical) fires in trucks will have maximum impact on operator safety and equipment protection. It is of utmost importance to detect and extinguish B-C class fires in equipment before they can evolve into major conflagrations involving the entire unit of equipment and endangering the operator. Because of his remote position of 10 feet or more above the ground, the operator must be made aware of a fire as rapidly as possible so that he may take whatever action is required to either extinguish the fire or remove himself from the immediate danger area. A fast-responding, reliable fire-sensing and extinguishing system must be provided. The system should be semiautomatic, providing immediate detection of fire, instant warning to the driver that a fire exists, and allow the driver to take corrective action.

PB-232 406/9GA PC$5.00/MF$1.45
FMC Corp., San Jose, Calif. Advanced Products Div.
IMPROVED SENSORS AND FIRE CONTROL SYSTEMS FOR MINING EQUIPMENT. PHASE II.
Contract research rept. (Final) Jun 72-May 73.
May 73, 160p BuMines-OFR-25(2)-74
Contract H0122053
See also PB-232 405.

Descriptors: *Fire safety, *Mining equipment, *Trucks, *Fire detection systems, *Fire extinguishers, Mine haulage, Fire protection, Fire extinguishing agents.

Effective fire protection can be obtained within current technology for mining equipment at moderate cost under a system developed under the contract. (a) The system self-check features (startup and continuous) are effective to automatically monitor circuit status. (b) The automatic discharge circuit (with delay and optional operator override) offers effective protection against inability of the operator to initiate manual discharge. (c) The control panel, which contains the audible/visual indicators, circuit fault and system status signals, is positioned properly for maximum legibility and effectiveness of warning. (d) Discharge of dry powder through a solenoid valve is an effective and feasible method to automatically release fire extinguishing agent. (e) Precharge pressure of 500 psig adequately discharged 18 lbs. of dry power adgent through system piping. (f) Effectiveness of the system is dependent upon selection of correct nozzle type and location. (g) Maximum effectivness was achieved by using two types of sensing elements - optical and thermal.

PB-232 772/4GA PC$5.25/MF$1.45
Safety in Mines Research Establishment, Buxton (England).
A SUMMARY OF EXPERIMENTAL DATA ON THE MAXIMUM EXPERIMENTAL SAFE GAP,
G. A. Lunn, and H. Phillips. 1973, 41p SMRE-R2

Descriptors: *Mining equipment, *Electric equipment, *Fire safety, Flash point, Gases, Tables(Data), Reviews, Bibliographies, Great Britain.

Since research on the flameproof enclosure of electrical equipment for use in flammable atmospheres was initiated by Beyling (1906) many organizations have carried out work to determine maximum experimental safe gaps (MESGs), with the result that the data are widely scattered and not always easily available. This report collects together experimental data from a wide range of literature and gives a list of MESGs for 25.4-mm (1-inch) and 25-mm flanges. The experimental conditions are described, with information on the numbers of tests and the gap size increments employed (only data from tests in which the increments were 0.05 mm or less are included). The two main types of vessel that have been used for MESG determinations are the British 8-litre spherical vessel and its modifications, and the IEC 20-ml vessel and its modifications. (Modified author abstract)

PB-233 026/4GA PC$5.70/MF$1.45
Appalachian Regional Commission, Washington, D.C.
ANALYSIS OF POLLUTION CONTROL COSTS,
Frank J. Doyle, Harasiddiprasad G. Bhatt, and John R. Rapp. Feb 74, 421p* EPA-670/2-74-009
Prepared by Michael Baker, Jr., Inc., Beaver, Pa.

Descriptors: *Monongahela River Basin, *Coal mines, *Strip mining, *Waste disposal, *Pollution, *Reclamation, *Cost analysis, Drainage, Handbooks, Air pollution, Water pollution, Land reclamation, Combustion, Solid waste disposal, Industrial waste treatment, Costs, Erosion, Mine water, Tailings, Refuse, Pennsylvania, Maryland, West Virginia, Water treatment.
Identifiers: Air pollution control, Water pollution control, Mine acid drainage.

This report fulfills requirements for an effective, workable handbook on pollution control costs and factors effecting these costs for the Monongahela River Basin. The information is based on the latest technological developments and cost analyses of recent reclamation projects. Although the report was developed for the Monongahela River Basin study, the cost estimates and supporting data should prove useful for all of Appalachia and other areas with similar topography, coal mine drainage pollution problems and mining history. Specific areas covered are surface mines, refuse piles, mine sealing, mine drainage treatment, air pollution control, solid waste handling and disposal, abandoned automobiles, and erosion and sedimentation control.

PB-233 251/8GA PC$4.50/MF$1.45
Commonwealth Scientific and Industrial Research Organization, Melbourne (Australia). Div. of Applied Geomechanics.
ASSESSMENT OF MINE FILL PROPERTIES, WARREGO MINES, N. T.
Technical rept.,
O. G. Ingles, R. C. Neil, and T. J. Richards. 1973, 26p TR-19

Descriptors: *Copper ores, *Stope mining, *Earth fills, Mining engineering, Australia.

This report offers a preliminary appraisal of the material properties of a local fill proposed for use in the Warrego Mine, Northern Territory; and seeks to define significant factors for the stabilization of such fill. Grading, density, additive composition and stability to mine water are considered in relation to strength of the natural and stabilized material. These tests are complemented by model studies which seek to reproduce, on a greatly reduced scale, the filling conditions as given. From the model studies, estimates are made of the role of density, moisture content, segregation and angle of repose (cohesion and friction) in bulk properties of the placed fill.

SLA-74-148 PC$4.50/MF$1.45
Sandia Labs., Albuquerque, N.Mex. (Usa).
PROPOSAL FOR IMPROVED DEEP DRILLING.
M. M. Newsom. Apr 74, 27p
Contract AT(29-1)-789

Descriptors: (*Natural gas, *Production), (*Petroleum, Production), Cavitation, Depth, Economics, Electricity, Explosions, Nondestructive testing, Oil drilling, Rock drilling, Time dependence.

For abstract, see NSA 30 01, number 02200.

TT-73-58003 PC$3.00/MF$1.45
Geological Survey, Reston, Va.
THE PROBLEM OF RELAXATIONAL PROCESSES IN ROCK MASS SURROUNDING A HORIZONTAL OPENING (K VOPROSU O RELAKTSIONNYKH PROTSESSAKH V MASSIVE POROD VMESHCHAYUSHCHEM GORIZONTALNUYU VYRABOTKU),
Yu. A. Veksler. 1974, 9p
Trans. from Vsesoyuznaya Nauchnaya Konferentsiya po Mekhanike Gornykh Porod (1st). Materialy, Alma Ata, 1966. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: *Rock mechanics, *Mines, Stress relaxation, Translations, USSR.

The study processes occurring in rock is based on the development of different phenomenological models of the solid body. In order to understand the varieties of special features of these processes, it is necessary to emphasize the fundamentals of the phenomenon. The basic understanding of the phenomenon should be found on an atomic level. At present in mining practice, the relaxation time is defined as the time during which either stresses are decreasing in e (or another value) times at a constant deformation or deformation is increasing in e times at a constant stress. This definition is critically discussed in this report.

TT-73-58006 PC$3.00/MF$1.45
Geological Survey, Reston, Va.
STRESS CONDITION OF A HARD ROCK MASS UNRUPTURED BY OPENINGS (O NAPRYAZHENNOM SOSTOYANII MASSIVA SKALNYKH POROD NE NARUZHENNOGO VYRABOTKAMI),
G. A. Markov, and I. A. Tyrchaninov. 1974, 9p

Trans. from Vsesoyuznaya Nauchnaya Konferentsiya po Mekhanike Gornykh Porod (1st). Materialy, Alma Ata, 1966. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: *Rock mechanics, *Mines, Calcium phosphates, Stresses, Compression tests, Translations, USSR.

The Rasvumcorr apatite mine (Kola Peninsula) was developed by main and auxiliary openings driven in hard rocks of high strength (f = 10-14). At the time of driving, the rock pressure is reflected by failure at some parts of the openings. To determine the causes and conditions of rock failure, special investigations were performed. Visual observations confirmed the following two points: First, the failure of anomalously high stressed rocks in the form of hard firm rocks falling at insignificant depth is an unusual phenomenon. Secondly, there is a zone of rock failure around the rim of the horizontal openings proving that the forces causing the highly stress condition are directed horizontally. Laboratory data of mechanical rock properties carried out on samples strictly oriented in space, showed the absence of anisotropic properties in the characteristic directions. Compression tests on rock samples showed that 'stress-deformation' curve remained rectilinear. The failure of specimen occurred similar to the explosion failure.

8J. Physical Oceanography

AD-780 537/7GA PC$3.75/MF$1.45
Coast Guard Washington D C
REPORT OF THE INTERNATIONAL ICE PATROL SERVICE IN THE NORTH ATLANTIC OCEAN (SEASON OF 1972).
30 Jan 74, 60p Rept nos. USCG-Bull-58, USCG-188-27
See report dated 1971, AD-778 013.

Descriptors: *Ice reporting, *North Atlantic Ocean, *Sea ice, Aerial reconnaissance, Ice islands, Icebergs, Maps, Meteorological charts.
Identifiers: International ice patrol, Labrador Sea, Baffin Bay.

The report is 58th in a series of ANNUAL REPORTS on the International Ice Patrol Service in the North Atlantic Ocean. It contains information on Ice Patrol organization, communications and operations, on ice and environmental conditions and their relationship in 1972, and on the dynamic topography surveys conducted during April, May and June 1972.

AD-780 541/9GA PC$3.00/MF$1.45
Oregon State Univ Corvallis School of Oceanography
EXPOSURE: A NEWSLETTER FOR OCEAN TECHNOLOGISTS. VOLUME 2, NUMBER 1. A FAIL-SAFE SYSTEM TO PREVENT THE LOSS OF 'TWO-BLOCKED' OCEANOGRAPHIC INSTRUMENTS,
Roderick S. Mesecar. Mar 74, 17p
See also Volume 1, number 6, AD-780 205.

Descriptors: *Oceanographic equipment, *Periodicals, Towing cables, Fastenings, Cable cutting devices, Marine biology, Towed bodies, Samplers, Mass spectrometers, Tracer studies.
Identifiers: CUEA program, Nutrients, IRIS system.

Contents:
A fail-safe system to prevent the loss of 'two-blocked' oceanographic instruments;
On-going technical efforts in the biological components of the coastal upwelling ecosystems analysis program.

AD-780 542/7GA PC$3.00/MF$1.45
Oregon State Univ Corvallis School of Oceanography
EXPOSURE: A NEWSLETTER FOR OCEAN TECHNOLOGISTS. VOLUME 2, NUMBER 2. A ROCK DRILL FOR RUM II,
Roderick S. Mesecar. May 74, 13p
See also Volume 2, number 1, AD-780 541.

Descriptors: *Oceanographic equipment, *Periodicals, Ocean bottom sampling, Rock drilling, Drilling machines, Marine biology, Acoustic detection, Signal processing, Computer applications.
Identifiers: RUM(Remote Underwater Manipulator), Remote underwater manipulator, CUEA program, PDP-11/45 computers.

Contents:
A rock drill for RUM II;
CUEA bioacoustic assessment system.

AD-780 784/5GA PC$3.00/MF$1.45
Naval Research Lab Washington D C
ARTIFICIAL SEA SLICKS: THEIR PRACTICAL APPLICATIONS AND ROLE IN FUNDAMENTAL RESEARCH.
Interim rept.,
William R. Barger, and William D. Garrett. 4 Jun 74, 17p Rept no. NRL-7751

Descriptors: *Ocean surface, *Monomolecular films, Oils, Water pollution, Markers, Removal, Organic compounds, Damping, Gravity waves, Air water interactions, Visibility, Underwater objects, Fluorescent dyes, Alcohols, Oil spills.
Identifiers: Oil control films, Capillary waves, Oil slicks, Oleyl alcohols.

Artificial sea slicks are man-made, monomolecular, organic films adsorbed at the air-sea interface. They are formed from spontaneously spreading, water-insoluble polar liquids. Techniques for generating artificial sea slicks from surface vessels and from the air have been devised. Research into the chemical modification of air-sea interactions has led to several practical applications for artificial sea slicks. The ability of organic surface films to damp capillary waves renders the area covered by the film highly visible and sensible under most environmental conditions. The attenutation of both capillary and high-frequency gravity waves by artificial sea slicks has been examined under open-ocean conditions. The wave-damping property has been used as a basis for the development of seamarkers that generate highly visible, persistent ripple-damped zones on the sea surface. Large artificial slicks have been used as a tool to elucidate the mechanisms of wind-wave interactions and air-sea exchange processes. The most widely used application of film-forming organic chemicals is for the control and containment of oil spills, and increasing the efficiency of oil retrieval operations. (Modified author abstract)

AD-780 842/1GA PC$4.00/MF$1.45
Naval Underwater Systems Center Newport R I
OPERATION GHUBBET: OUTLINE OF EXPERIMENTAL PHASE.
Technical memo.,
Everett N. Jones, and William H. Thorp. 19 Nov 71, 11p Rept no. NUSC-TM-TA13-242-71

Descriptors: *Oceanographic data, *Red Sea, Underwater sound, Sound transmission, Depth, Temperature, Salinity, Bathythermograph data.
Identifiers: *Aden Gulf, *Bab El Mandeb Strait, Ghubbet operation.

Operation Ghubbet was conducted between 7 and 25 September 1971 jointly with Naval Underwater Systems Center, New London and the French Navy based at Djibouti, T.F.A.I. The principal objectives of the project were to investigate the acoustic properties and the associated water characteristics in the area of the sill separating the Red Sea from the Gulf of Aden. Because of the unusual oceanographic properties in the Strait of Bab-El-Mandeb and in the vicinity of the Hanish Islands, part of the project (Phase I) was devoted to determining, in detail, parameters that would influence sound propagation. Phase II used two ships to measure sound propagation in four different experimental situations.

AD-780 844/7GA PC$4.00/MF$1.45
Naval Underwater Systems Center Newport R I
PROJECT BOLD VENTURE: LAKE TANGANYIKA SOUND ATTENUATION EXPERIMENT.
Technical memo.,
David G. Browning, J. M. Gorman, E. N. Jones, W. H. Thorp, and R. H. Mellen. 14 Feb 72, 16p
Rept no. NUSC-TM-TA131-59-72
Presented at the meeting at the Acoustical Society of America (82 nd) Denver, Colo., Paper N8.

Descriptors: *Lakes, *Underwater sound, Sound transmission, Acoustic attenuation, Fresh water, Low frequency.
Identifiers: Bold venture project, *Lake Tanganyika.

In order to determine the cause of the low-frequency sound attenuation anomaly in seawater, comparative measurements are being made in freshwater. The Lake Tanganyika experiment was conducted to determine the temperature dependency of the anomaly and to overcome the depth limitations of the previous Lake Superior experiment. The sound propagation run was conducted along a 275km track with an average water depth of 750m. Attenuation coefficients were obtained for center frequencies between 800-10,000 Hz in 1/3-oct bands. The results show excess attenuation, but no relaxation frequency can be defined. Comparison is made between the Lake Superior and Lake Tanganyika experiments. (Author)

AD-780 845/4GA PC$4.25/MF$1.45
Naval Underwater Systems Center Newport R I
LOW FREQUENCY SOUND ATTENUATION ANOMALY IN THE OCEAN: RECENT EXPERIMENTAL MEASUREMENTS.
Technical memo.,
D. G. Browning, E. N. Jones, R. H. Mellen, and W. H. Thorp. 8 Jun 71, 24p Rept no. NUSC-TM-TA11-147-71
See also report dated 5 Mar 73, AD-757 664.

Descriptors: *Sea water, *Underwater sound, *Acoustic attenuation, Correlation techniques, Salinity, Temperature, Pressure, Marine biology, Low frequency.

Numerous explanations have been put forth for the low frequency sound attenuation anomaly in the oceans. Since laboratory measurements are difficult to perform in the frequency range, a series of experiments were conducted in natural bodies of water to determine the effect of salinity, temperature, pressure and biological activity. The areas in which experiments have been conducted to date are: Lake Superior, Lake Tanganyika, Red Sea and Hudson Bay. The results of these experiments are compared with other recent measurements in the Pacific Ocean and Mediterranean Sea. Although significant variations are noted among the sites, no one mechanism appears to be clearly responsible. (Author)

AD-780 850/4GA PC$11.50/MF$1.45
Coast Guard Washington D C
INTERNATIONAL ICE OBSERVATION AND ICE PATROL SERVICE IN THE NORTH ATLANTIC OCEAN (SEASON OF 1953).
Annual rept.,
A. J. Bush, R. E. Lenczyk, J. E. Murray, and Floyd M. Soule. 1955, 164p Rept nos. USCG-Bull-39, USCG-188-8
See also AD-780 851.

Descriptors: *Ice reporting, *Oceanographic data, *North Atlantic Ocean, Sea ice, Aerial reconnaissance, Ice islands, Icebergs, Coast Guard, Patrol craft, Surface temperature, Ocean currents, Tables(Data), Depth, Salinity.
Identifiers: International ice patrol 1953, Labrador Sea.

The bulletin is No. 39 in the series of annual reports on the International Ice Observation and Ice Patrol Service, season of 1953. It contains a report of the observation operations which extended from 6 March to 6 June 1953. Ship, aircraft and communications activities are described and special sections deal with observed monthly ice conditions and statistics on ice and sea temperature. Also included is a preliminary presentation of the oceanographic data collected during 1953, charts of dynamic topography of the sea surface (ocean current maps), tables of oceanographic data, and a brief discussion of the results of the season's oceanographic surveys.

AD-780 851/2GA PC$13.25/MF$1.45
Coast Guard Washington D C
INTERNATIONAL ICE OBSERVATION AND ICE PATROL SERVICE IN THE NORTH ATLANTIC OCEAN (SEASON OF 1954).
Annual rept.,
A. J. Bush, J. E. Murray, and Floyd M. Soule.
1955, 204p Rept nos. USCG-Bull-40, USCG-188-9
See also AD-780 850 and AD-780 852.

Descriptors: *Ice reporting, *Oceanographic data, *North Atlantic Ocean, Sea ice, Aerial reconnaissance, Ice islands, Icebergs, Coast Guard, Patrol craft, Surface temperature, Ocean currents, Tables(Data), Depth, Salinity.
Identifiers: International ice patrol 1954, Labrador Sea.

The bulletin is No. 40 in the series of annual reports on the International Ice Observation and Ice Patrol Service, season of 1954. It contains a report of the observation operations which extended from 6 February to 16 July 1954. Ship, aircraft and communications activities are described and special sections deal with observed monthly ice conditions and statistics on ice and sea temperature. Also included is a preliminary presentation of the oceanographic data collected during 1954, charts of dynamic topography of the sea surface (ocean current maps), tables of oceanographic data, and a brief discussion of the results of the season's oceanographic surveys.

AD-780 852/0GA PC$10.25/MF$1.45
Coast Guard Washington D C
INTERNATIONAL ICE OBSERVATION AND ICE PATROL SERVICE IN THE NORTH ATLANTIC OCEAN (SEASON OF 1955).
Annual rept.,
A. J. Bush, J. E. Murray, and Floyd M. Soule.
1956, 144p Rept nos. USCG-Bull-41, USCG-188-10
See also AD-780 851 and AD-780 853.

Descriptors: *Ice reporting, *Oceanographic data, *North Atlantic Ocean, Sea ice, Aerial reconnaissance, Ice islands, Icebergs, Coast Guard, Patrol craft, Surface temperature, Ocean currents, Tables(Data), Depth, Salinity.
Identifiers: International ice patrol 1955, Labrador Sea.

The bulletin is No. 41 in the series of annual reports on the International Ice Observation and Ice Patrol Service, season of 1955. It contains a report of the observation operations which extended from 24 February to 15 July 1955. Ship, aircraft and communications activities are described and special sections deal with observed monthly ice conditions and statistics on ice and sea temperature. Also included is a preliminary presentation of the oceanographic data collected during 1955, charts of dynamic topography of the sea surface (ocean current maps), tables of oceanographic data, and a brief discussion of the results of the season's oceanographic surveys. (Author)

AD-780 853/8GA PC$9.50/MF$1.45
Coast Guard Washington D C
INTERNATIONAL ICE OBSERVATION AND ICE PATROL SERVICE IN THE NORTH ATLANTIC OCEAN (SEASON OF 1956).
Annual rept.,
A. J. Bush, J. E. Murray, and Floyd M. Soule.
1957, 129p Rept nos. USCG-Bull-42, USCG-188-11
See also AD-780 852 and AD-780 854.

Descriptors: *Ice reporting, *Oceanographic data, *North Atlantic Ocean, Sea ice, Aerial reconnaissance, Ice islands, Icebergs, Coast Guard, Patrol craft, Surface temperature, Ocean currents, Tables(Data), Depth, Salinity.
Identifiers: International ice patrol 1956, Labrador Sea.

The bulletin is No. 42 in the series of annual reports on the International Ice Observation and Ice Patrol Service, season of 1956. It contains a report of the observation operations which extended from 5 March to 13 July 1956. Ship, aircraft and communications activities are described and special sections deal with observed monthly ice conditions and statistics on ice and sea temperature. Also included is a preliminary presentation of the oceanographic data collected during 1956, charts of dynamic topography of the sea surface (ocean current maps), tables of oceanographic data, and a brief discussion of the results of the season's oceanographic surveys.

AD-780 854/6GA PC$9.25/MF$1.45
Coast Guard Washington D C
INTERNATIONAL ICE OBSERVATIONS AND ICE PATROL SERVICE IN THE NORTH ATLANTIC OCEAN (SEASON OF 1958).
Annual rept.,
R. P. Dinsmore, R. M. Morse, and Floyd M. Soule.
1960, 122p Rept nos. USCG-Bull-44, USCG-188-13
See also AD-780 853 and AD-780 855.

Descriptors: *Ice reporting, *Oceanographic data, *North Atlantic Ocean, Sea ice, Aerial reconnaissance, Ice islands, Icebergs, Coast Guard, Patrol craft, Surface temperature, Ocean currents, Tables(Data), Depth, Pack ice.
Identifiers: International ice patrol 1958, Labrador Sea.

The bulletin is No. 44 in the series of annual reports on the International Ice Observation and Ice Patrol Service, season of 1958. It contains a report of the observation operations which extended from 14 March to 10 June 1958. Ship, aircraft and communications activities are described and special sections deal with observed monthly ice conditions and statistics on ice and sea temperature. Also included is a preliminary presentation of the oceanographic data collected during 1958, charts of dynamic topography of the sea surface (ocean current maps), tables of oceanographic data, and a brief discussion of the results of the season's oceanographic surveys. (Author)

AD-780 855/3GA PC$12.00/MF$1.45
Coast Guard Washington D C
INTERNATIONAL ICE OBSERVATION AND ICE PATROL SERVICE IN THE NORTH ATLANTIC OCEAN (SEASON OF 1959).
Annual rept.,
T. F. Budinger, R. P. Dinsmore, P. A. Morrill, and Floyd M. Soule. 1960, 177p Rept nos. USCG-Bull-45, USCG-188-14
See also AD-780 854 and AD-777 945.

Descriptors: *Ice reporting, *Oceanographic data, *North Atlantic Ocean, Sea ice, Aerial reconnaissance, Ice islands, Icebergs, Coast Guard, Patrol craft, Surface temperature, Pack ice, Tables(Data), Salinity, Radar reflections, Depth.
Identifiers: International ice patrol 1959.

The bulletin is No. 45 in the series of annual reports on the International Ice Observation and Ice Patrol Service, season of 1959. It is divided into three general parts. The first is a report of the patrol operations which extended from 5 March to 17 July 1959. Ship, aircraft and communications activities are described in detail and special sections deal with observed monthly ice conditions, experiments in iceberg demolition, a summary of ice conditions 1900-1959 and statistics on ice reports for 1959. The second part is a special report on a program of ice detection by radar conducted during the 1959 season. The final section comprises a preliminary presentation of the oceanographic data collected during 1959. (Modified author abstract)

AD-780 898/3GA PC$3.75/MF$1.45
Texas Univ Austin Applied Research Labs
ACOUSTICS OF GAS-BEARING SEDIMENTS.
Aubrey L. Anderson. May 74, 174p Rept no. ARL-TR-74-19
Contract N00014-70-A-0166-0017

Descriptors: *Acoustic properties, *Sediments, *Gases, *Ocean bottom, *Underwater sound, Bubbles, Gas dynamics, Acoustic velocity, Acoustic attenuation, Sea water.

Acoustical properties of water saturated and gassy sediments are observed to be significantly different. The present state of knowledge of the acoustical properties of saturated sediments, gassy water, and gassy sediments is reviewed. The dynamics of bubbles in water and in various solid materials, including sediments, are experimentally examined. Pulsation resonance is exhibited by the bubbles in all materials examined. Predictions of bubble resonance frequency and damping are shown to agree with the measurements. Equations for sound speed and attenuation, based on the model of resonating gas bubbles, are shown to agree with published measurements in gassy sediments. Parameters required for predicting gassy sediment acoustical properties are identified. Ranges of values of these parameters for various sediments are discussed. (Author)

AD-780 962/7GA PC$5.00/MF$1.45
Defence Research Establishment Ottawa (Ontario)
SVERDRUP CHANNEL.
Technical note,
Harold V. Serson. May 74, 37p Rept no. DREO-TN-74-10

Descriptors: *Oceanographic data, *Sea ice, *Arctic regions, Thickness, Ocean currents, Temperature, Profiles, Salinity, Canada.
Identifiers: *Sverdrup Channel, Ice cover.

The report assesses the available physical and environmental information on Sverdrup Channel.

COM-74-11145/1GA PC$4.00/MF$1.45
National Oceanographic Instrumentation Center, Washington, D.C.
LABORATORY EVALUATION OF DISSOLVED OXYGEN ANALYZERS.
Sep 72, 14p Technical Bull-RN-1007 NOAA-74051643

Descriptors: *Analyzers, *Water quality, *Water analysis, Performance evaluation, Dissolved gases, Oxygen, Specifications, Portable equipment, Electrical properties, Reproducibility, Environmental tests.
Identifiers: *Oceanographic equipment, *Dissolved oxygen analyzers.

Recently, the National Oceanographic Instrumentation Center conducted laboratory evaluations on four dissolved oxygen meters. The results were reported in individual Instrument Fact Sheets, that is IFS-73003, Beckman Instruments Model 735 Dissolved Oxygen Analyzer; IFS-73004, Beckman Instruments MINOS DOM Dissolved Oxygen Monitor; IFS-73005, Ionics Model 1131 Dissolved Oxygen Analyzer; and IFS-73006, Hydrolab Model 11A Portable Water Quality Analyzer. Selected manufacturers' performance specifications and the NOIC test results are presented in the tables. (Modified author abstract)

COM-74-11147/7GA PC$4.00/MF$1.45
National Oceanographic Instrumentation Center, Washington, D.C.
FIELD TEST REPORT ON INTEROCEAN ACOUSTIC RELEASE DEVICES.
May 73, 14p Technical Bull-RN-1008 NOAA-74051644

Descriptors: *Acoustic receivers, *Pingers, *Signal processing, Instrument characteristics, Echo sounding, Electroacoustic transducers, Performance evaluation, Field tests, Environmental tests.
Identifiers: *Oceanographic equipment, Echo sounder processors, Digital range indicators.

Recently, field tests were made in the Gulf of Mexico by personnel of the National Oceanographic Instrumentation Center on three acoustic release devices manufactured by InterOcean Systems, Inc., of San Diego, Calif. This report summarizes the findings. Also reported in this Technical Bulletin are the results of comparative field testing of the Raytheon CESP-1 Correlation Processor and a conventional short pulse echo sounding system. Sea testing demonstrated that a 20-db processing gain was obtainable under field conditions with the CESP-1 when compared to the performance of a conventional short-pulse system.

COM-74-11150/1GA PC$4.00/MF$1.45
National Oceanographic Instrumentation Center, Washington, D.C.
CHECKOUT PROCEDURES.
Mar 71, 8p Technical Bull-RN-1004 NOAA-74051640

Descriptors: *Measuring instruments, *Performance tests, Checkout, Salinometers, Temperature measuring instruments, Bathymetry, Recording instruments, Calibrating.
Identifiers: *Oceanographic equipment.

The reliable performance of some oceanographic instruments is dependent on proper checkout procedures. The Reliability Division of the National Oceanographic Instrumentation Center develops checkout procedures when necessary and disseminates them throughout the oceanographic community. The report sets forth the checkout procedures for the Gulton Temperature Recorder Model 147, the Beckman RS 5-3 Salinometer, and five bathymetric recorders.

COM-74-11151/9GA PC$4.00/MF$1.45
National Oceanographic Instrumentation Center, Washington, D.C.
MAINTENANCE NOTES ON SIPPICAN EXPENDABLE BT SYSTEM (SIPPICAN SURFACE XBT-AN/SSQ-56A).
Oct 71, 6p Technical Bull-RN-1005 NOAA-74051651

Descriptors: *Bathythermographs, *Maintenance, Specifications, Test equipment, Test methods, Inspection.
Identifiers: *Oceanographic equipment.

Four procedures are recommended to reduce the incidence of equipment failure in the Sippican Expendable BT system. The tools, parts, materials, and test equipment required for each operation are specified as well as the mandatory inspection period.

COM-74-11152/7GA PC$4.00/MF$1.45
National Oceanographic Instrumentation Center, Washington, D.C.
MODEL 9060 SELF-CONTAINED SALINITY, TEMPERATURE, AND DEPTH RECORDER. PLESSEY ENVIRONMENTAL SYSTEMS, SAN DIEGO, CALIFORNIA 92123.
Instrument fact sheet.
Feb 72, 10p IFS-72004 NOAA-74051637

Descriptors: *Temperature measuring instruments, *Depth detectors, *Salinometers, Recorder characteristics, Sea water, Performance evaluation, Electrical resistivity, Specifications, Electrical properties, Tolerances(Mechanics), Environmental tests.
Identifiers: *Oceanographic equipment.

The Plessey Environmental Systems Model 9060 Self-Contained STD Recorder is designed to measure sea-water salinity, temperature, and depth and to record the sensed data on an internal X1X2Y drum recorder. Salinity is determined by sensing conductivity with a sea-water-coupled inductive cell in conjunction with temperature and pressure compensating devices. Temperature and pressure are independently sensed by a platinum-wire thermometer and a platinum-wire strain gage, respectively. The instrument is intended for operation to depths as great at 6000 m (19,685 ft). Internal power is provided by 10 nickel-cadmium batteries connected for 6-volt operation. Following a tabulation of the manufacturer's performance specifications, information is given on the performance tests made in the Instrumentation Center.

COM-74-11153/5GA PC$4.00/MF$1.45
National Oceanographic Instrumentation Center, Washington, D.C.
WIRE-GUIDED SELF-PROPELLED WATER SAMPLER.
Dec 71, 10p Technical Bull-DE-1002 NOAA-74051639

Descriptors: *Samplers, *Water analysis, *Ocean currents, Performance evaluation, Deep water, Instrument characteristics, Bathythermography, Efficiency.
Identifiers: *Oceanographic equipment, Water samplers.

The bulletin contains the findings on tests of wire-guided self-propelled water sampler and preliminary tests on a vortex shedding current meter. The concept of a wire-guided unpowered device for deep-water sampling shows promise since average velocities of 5 ft/sec were achieved in the field. The depth capabilities are limited only by the strength-buoyancy ratio of the flotation material. This concept could be extrapolated to include use as a carrier for self-contained recording sensor packages since the probe would descend and ascend at known velocities and attitudes. The principles of the vortex shedding current meter appears to offer possibilities as a no-moving-parts instrument of relative simplicity and low cost.

COM-74-11154/3GA PC$4.00/MF$1.45
National Oceanographic Instrumentation Center, Wassington, D.C.
INDEX TO NATIONAL OCEANOGRAPHIC INSTRUMENTATION CENTER INSTRUMENT FACT SHEETS.
Jun 73, 12p IFS-73011 NOAA-74051638

Descriptors: *Measuring instruments, *Indexes(Documentation), *Oceanography, Temperature measuring instruments, Acoustic measuring instruments, Pressure gages, Flowmeters, Ocean currents, Salinometers, Depth finders, Bathymetry.
Identifiers: *Oceanographic equipment.

The index is issued as a service for the recipients of the Instrument Fact Sheet series and is published periodically by the National Oceanographic Instrumentation Center in Washington, D.C. The index is not intended for use as a catalog or a directory; names of companies and geographic locations are cited as they existed at the time the IFS was published. The index is categorized in terms of (1) a chronological listing under equipment class and (2) an overall chronological listing of all IFSs published to date.

COM-74-11155/0GA PC$4.00/MF$1.45
National Oceanographic Instrumentation Center, Washington, D.C.
MODEL 333A-5 PRECISION BATHYMETRIC RECORDER. EDO WESTERN CORPORATION, SALT LAKE CITY, UTAH 84115.
Instrument fact sheet.
Mar 71, 10p IFS-71010 NOAA-74051631

Descriptors: *Depth finders, *Recording instruments, *Ocean bottom, Bathymetry, Specifications, Performance evaluation, Electrical properties, Tolerances(Mechanics), Environmental tests.
Identifiers: *Oceanographic equipment.

The Edo Western Model 333A-5 Precision Bathymetric Recorder is an all-solid-state electromechanical instrument used primarily in oceanography for obtaining ocean bottom profiles (or water depths in general). Echoes from the transmitted sound burst are processed in the shipboard transceiver, amplified, and read out on a chart recorder to provide an integrated profile of the ocean bottom. Following a tabulation of the manufacturer's performance specifications, information is given on the performance tests made in the Instrumentation Center.

COM-74-11157/6GA PC$4.00/MF$1.45
National Oceanographic Instrumentation Center, Washington, D.C.
MODEL 775-21 CONDUCTIVITY-TEMPERATURE-DEPTH UNDERWATER SENSOR UNIT. GEODYNE DIVISION, EG AND G INTERNATIONAL, WALTHAM, MASSACHUSETTS 02154.
Instrument fact sheet.
May 71, 10p IFS-71012 NOAA-74051633

Descriptors: *Measuring instruments, *Instrument characteristics, Specifications, Temperature measuring instruments, Electrical resistivity, Depth, Performance evaluation, Electrical properties, Tolerances(Mechanics), Environmental tests.
Identifiers: *Oceanographic equipment.

The Geodyne Model 775-21 CTD Underwater Sensor Unit is designed to measure the ocean parameters of conductivity in the range between 25 and 65 millimhos, temperature in the range between-2C and +35C, and pressure to 500 psia. The sensor unit is interrogated remotely by deck equipment consisting of a Model 993 Digital Display Monitor, a Model 990 Cable Interface Unit, and a Model 256-0 Power Supply. The cable interface unit sends timing to and receives data from the remote CTD sensor unit via two-conductor cable. Conductivity is measured with a seawater-coupled inductive cell, temperature with a platinum wire sensor, and pressure with a strain gauge bridge. Following a tabulation of the manufacturer's performance specifications, information is given on the performance tests made in the Instrumentation Center.

COM-74-11158/4GA PC$4.00/MF$1.45
National Oceanographic Instrumentation Center, Washington, D.C.
MODEL 800A FINE LINE DEPTH RECORDER. ROSS LABORATORIES, INC., SEATTLE, WASHINGTON 98102.
May 71, 8p IFS-71013 NOAA-74051634

Descriptors: *Depth detectors, *Ocean bottom, Specifications, Performance evaluation, Electrical properties, Tolerances(Mechanics), Environmental tests, Instrument characteristics.
Identifiers: *Oceanographic equipment.

The Ross Fine Line Model 800A Depth Recorder is intended for use in ocean-bottom surveying and fish location to depths of 800 fathoms (1463 meters). Following a tabulation of the manufactuer's performance specifications, information is given on the performance tests made in the Instrumentation Center.

COM-74-11159/2GA PC$4.00/MF$1.45
National Oceanographic Instrumentation Center, Washington, D.C.

MODEL DE-719 FATHOMETER DEPTH RECORDER. RAYTHEON COMPANY, MARINE PRODUCTS OPERATION, MANCHESTER, N.H. 03103.
Instrument fact sheet.
Nov 71, 11p IFS-72002 NOAA-74051635

Descriptors: *Depth finders, *Submarine topography, Specifications, Performance evaluation, Design, Portable equipment, Electrical properties, Tolerances(Mechanics), Environmental tests.
Identifiers: *Oceanographic equipment.

The Raytheon Model DE-719 Fathometer Depth Recorder is a portable survey sounder designed to provide a record of underwater topography at depths between 2 and 410 feet (0.61 to 125 meters). Solid-state in design, the recorder is intended for portable use but may be mounted temporarily or permanently on a bulkhead. Auxiliary controls are included to compensate for the effects of tide and draft as well as the speed of sound in water; these controls are located inside and are accessible through a hinged front window. Following a tabulation of the manufacturer's performance specifications, information is given on the performance tests made in the Instrumentation Center.

COM-74-11160/0GA PC$4.00/MF$1.45
National Oceanographic Instrumentation Center, Washington, D.C.
MODEL 210E ACOUSTIC RELEASE DEVICE AND MODEL 202MB ACOUSTIC SOUND INTERROGATOR. OCEAN RESEARCH EQUIPMENT INC., FALMOUTH, MASS. 02541.
Instrument fact sheet.
Jan 72, 10p IFS-72003 NOAA-74051636

Descriptors: *Underwater equipment, *Acoustic equipment, *Release mechanisms, Remote control, Control equipment, Command guidance, Instrument characteristics, Performance evaluation.
Identifiers: *Oceanographic equipment.

The Model 210E Acoustic Release Device is a remotely operated underwater unit designed to surface a buoyed instrument array (weight-moored) by opening a solenoid actuated release mechanism upon surface command from the associated Model 202MB Acoustic Command Interrogator. The device is intended for operation to depths of 2000 ft (610 m) at tensile loads up to 2000 lb (907 kg). Power is provided by a battery pack of proprietary design. The Model 202MB Acoustic Command Interrogator includes a command control unit and a submersible projector. Power is obtained from a rechargeable nickel-cadmium battery of proprietary design; the battery charger provided operates on 115-vac, 50/60-Hz mains. Electrical power is transmitted to the projector by means of a 150-ft (45.7-m) cable. Following a tabulation of the manufacturer's performance specification, information is given on the performance tests made in the Instrumentation Center.

COM-74-11161/8GA PC$4.00/MF$1.45
National Oceanographic Instrumentation Center, Washington, D.C.
MODEL ET-U VIBRA-TENSION. RUCKER CONTROL SYSTEMS, OAKLAND, CALIFORNIA. 94608.
Instrument fact sheet.
Mar 74, 10p IFS-74006 NOAA-74051622

Descriptors: *Tensiometers, *Wire rope, Cables, Strain measurement, Performance evaluation.
Identifiers: *Oceanographic equipment.

The Vibra-Tension Model ET-U tensiometer is manufactured by Rucker Control Systems and measures the tension or load in wire rope, cable, and prestress strands. The system consists of a readout unit, connecting cable, and transducers of two types that operate without direct in-line placement in the cable. One is an accelerometer type and is attached in direct contact with the cable to measure tension; the other, an electromagnetic type, is held within two inches and parallel to the cable. The instrument is designed for use with wire-rope diameters between one-quarter inch and two inches. Tensions are measured from 300 pounds to 1 million pounds on eight overlapping scales. Following a tabulation of the manufacturer's performance specifications, information is given on the performance tests made in the Instrumentation Center.

COM-74-11163/4GA PC$4.00/MF$1.45
National Oceanographic Instrumentation Center, Washington, D.C.
INDEX TO NATIONAL OCEANOGRAPHIC INSTRUMENTATION CENTER INSTRUMENT FACT SHEETS.
Instrument fact sheet.
Jun 73, 12p IFS-73011 NOAA-74051625

Descriptors: *Measuring instruments, *Indexes(Documentation), Temperature measuring instruments, Flowmeters, Depth finders, Acoustic velocity, Sensor characteristics, Bathymetry, Recorder characteristics, Salinity, Pressure measurement, Samplers, Cores.
Identifiers: *Oceanographic equipment.

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COM-74-11165/9GA PC$4.00/MF$1.45
National Oceanographic Instrumentation Center, Washington, D.C.
MODEL 209A LONG LIFE ACOUSTIC BEACON. BURNETT ELECTRONICS LAB., INC., SAN DIEGO, CALIFORNIA. 92123.
Instrument fact sheet.
Jan 71, 14p IFS-71007 NOAA-74051629

Descriptors: *Underground equipment, *Sonar beacons, Acoustic equipment, Instrument characteristics, Performance evaluation.
Identifiers: *Oceanographic equipment.

The Burnett Model 209A Long Life Acoustic Beacon is an in-situ underwater sonic transmitter designed to aid in the relocation of a coordinate position or a deployed subsurface object or instrumentation package. The instrument is intended for use to depths of 200 feet (61 meters) in salt water for periods as long as one year and has a slightly positive buoyancy to maintain an upright position on deployment which also prevents burial in bottom sediments. The operating range is specified to be in excess of one mile depending on the sensitivity of the receiver employed. Mercury batteries are used to supply the bias to the electronics section where the desired signal is shaped. The device is energized by opening the pressure case and connecting the free battery terminal to the electronics section. Following a tabulation of the manufacturer's performance specifications, information is given on the performance tests made in the Instrumentation Center.

COM-74-11167/5GA PC$4.00/MF$1.45
National Oceanographic Instrumentation Center, Washington, D.C.
TYPE RSQD-2A CONDUCTIVITY RECORDER. BECKMAN INSTRUMENTS, INC., CEDAR GROVE OPERATIONS, CEDAR GROVE, NEW JERSEY. 07009.
Instrument fact sheet.
Jan 71, 10p IFS-71006 NOAA-74051628

Descriptors: *Measuring instruments, *Electrical resistivity, *Recording instruments, Recorder charcteristics, Specifications, Design, Performance evaluation, Electrical properties, Tolerances(Mechanics), Environmental tests.
Identifiers: *Oceanographic equipment.

The Beckman Instruments Type RSQD-2A Conductivity Recorder is primarily designed for unattended operation to inductively measure electrolytic conductivity in rivers, bays, and estuaries. Following a tabulation of the manufacturer's performance specifications, information is given on the performance tests made in the Instrumentation Center.

COM-74-11168/3GA PC$4.00/MF$1.45
National Oceanographic Instrumentation Center, Washington, D.C.
MODEL MINOS DOM DISSOLVED OXYGEN MONITOR. BECKMAN INSTRUMENTS, INC., FULLERTON, CALIF. 92634.
Instrument fact sheet.
Sep 72, 10p IFS-73004 NOAA-74051610

Descriptors: *Dissolved gases, *Oxygen, *Measuring instruments, Performance evaluation, Sea water, Water quality.
Identifiers: *Oceanographic equipment.

The Beckman Instruments MINOS DOM Dissolved Oxygen Monitor is designed primarily for oceanographic research and is intended to measure dissolved oxygen in sea water to depths of 3000 meters. The instrument is composed of a stainless steel pressure casing which houses the dissolved oxygen sensor, a temperature-compensating thermistor, signal-conditioning amplifiers, a d-c to d-c converter, a pressure compensator, a voltage-controlled oscillator, and an f-m power amplifier. Following a tabulation of the manufacturer's performance specifications, information is given on the performance tests made in the Instrumentation Center.

COM-74-11169/1GA PC$4.00/MF$1.45
National Oceanographic Instrumentation Center, Washington, D.C.
MODEL 1131 DISSOLVED OXYGEN ANALYZER, IONICS, INC., WATERTOWN, MASS. 02172.
Instrument fact sheet.
Sep 72, 10p IFS-73005 NOAA-74051611

Descriptors: *Dissolved gases, *Oxygen, *Measuring instruments, Water quality, Performance evaluation.
Identifiers: *Oceanographic equipment.

The Ionics Model 1131 Dissolved Oxygen Analyzer is designed to provide a continuous measurement of dissolved oxygen concentration in water systems for industrial applications. The instrument consists of a sensor and an electronics unit. Following a tabulation of the manufacturer's performance specifications, information is given on the performance tests made in the Instrumentation Center.

COM-74-11170/9GA PC$4.00/MF$1.45
National Oceanographic Instrumentation Center, Washington, D.C.
HYDROLAB 11A PORTABLE WATER QUALITY ANALYZER. HYDROLAB CORPORATION, AUSTIN, TEXAS 78757.
Instrument fact sheet.
Sep 72, 14p IFS-73006 NOAA-74051612

Descriptors: *Dissolved gases, *Oxygen, *Measuring instruments, Fresh water, Water quality, Performance evaluation.
Identifiers: *Oceanographic equipment.

The Hydrolab Corporation's 'Hydrolab 11A Portable Water Quality Analyzer' is an instrument designed in modular form to measure various water quality parameters in fresh water. The instrument is comprised of sensors for each of the modular units and a terminal unit in which the various modules are housed. The dissolved oxygen module consists of an amplifier package which is housed in the terminal unit and a polarographic

sensor containing a pair of thermistors for temperature compensation. The oxygen sensor has a silver anode core surrounded by an annular gold cathode and uses potassium chloride as the electrolyte. Following a tabulation of the manufacturer's performance specifications, information is given on the performance tests made in the Instrumentation Center.

COM-74-11171/7GA PC$4.00/MF$1.45
National Oceanographic Instrumentation Center, Washington, D.C.
MODEL PR-02 DIVER PINGER RECEIVER. HELLE ENGINEERING, INC., SAN DIEGO, CALIF. 92111.
Instrument fact sheet.
Nov 72, 13p IRS-73007 NOAA-74051613

Descriptors: *Underwater sound equipment, *Pingers, *Acoustic receivers, Divers, Specifications, Ultrasonic radiation, Performance evaluation, Design, Very low frequency, Electrical properties, Tolerances(Mechanics), Environmental tests.
Identifiers: *Oceanographic equipment.

The Helle Engineering Model PR-02 Diver Pinger Receiver is a directional unit used to locate acoustic sources that transmit signals in the frequency range between 26.5 and 27.5 kHz. The transducer elements are arranged in a linear array to provide a narrow pattern in one plane and a wider pattern in a plane perpendicular to the first. The detected signal is monitored by an earphone connected to the unit through a waterproof jack; the output level is set by means of a 10-turn potentiometer. The operator has the option of choosing two directivity patterns in the plane of the array: 5 and 15 degrees. This choice is made by rotating the instrument 180 degrees, thereby operating an internal mercury switch. The unit is powered by a replaceable 9-volt dry battery. Following a tabulation of the manufacturer's performance specifications, information is given on the performance tests made in the Instrumentation Center.

COM-74-11172/5GA PC$4.00/MF$1.45
National Oceanographic Instrumentation Center, Washington, D.C.
MODEL 6230 PORTABLE LABORATORY SALINOMETER, PLESSEY ENVIRONMENTAL SYSTEMS, SAN DIEGO, CALIFORNIA 92138.
Instrument fact sheet.
Jan 73, 14p IFS-73008 NOAA-74051614

Descriptors: *Salinometers, Electrical conductivity, Performance evaluation.
Identifiers: *Oceanographic equipment.

The Plessey Environmental Systems Model 6230 Portable Laboratory Salinometer measures the conductivity ratio between standard sea water and a sample of unknown salinity. Salinity is determined from conductivity ratio by the use of the International Oceanographic Tables (UNESCO) which are reproduced at the end of the manufacturer's instruction manual. Conductivity is measured with an electrodeless-type cell consisting of two insulated, toroidally wound coils arranged coaxially about the sample core. A thermistor circuit senses the temperature of the sample, and a dual-element platinum thermometer and thermistor assembly provides appropriate temperature compensation for conductivity measurements. Following a tabulation of the manufacturer's performance specifications, information is given on the performance tests made in the Instrumentation Center.

COM-74-11173/3GA PC$4.00/MF$1.45
National Oceanographic Instrumentation Center, Washington, D.C.
MODEL 9040-5C C.T.D.-SV ENVIRONMENTAL PROFILING SYSTEM. PLESSEY ENVIRONMENTAL SYSTEMS, SAN DIEGO, CALIFORNIA 92138.
Instrument fact sheet.
May 73, 18p IFS-73009 NOAA-74051615

Descriptors: *Measuring instruments, *Sea water, Electrical resistivity, Temperature measuring instruments, Depth, Acoustic velocity, Profilometers, Specifications, Design, Tolerances(Mechanics), Performance evaluation, Electrical properties, Environmental tests.
Identifiers: *Oceanographic equipment.

The Plessey Environmental Systems Model 9040-5C Environmental Profiling System is designed to obtain continuous profiles of ocean conductivity, temperature, and sound velocity as functions of depth. The underwater unit consists of a pressure housing containing transducers and conditioning electronics for transmission of data to the shipboard equipment for each of the variables being measured. Following a tabulation of the manufacturer's performance specifications, information is given on the performance tests made in the Instrumentation Center.

COM-74-11174/1GA PC$4.00/MF$1.45
National Oceanographic Instrumentation Center, Washington, D.C.
MODEL 4100 GRAPHIC RECORDER. EPC LABS., INC., BEVERLY, MASS. 01915.
Instrument fact sheet.
Jun 73, 14p IFS-73010 NOAA-74051616

Descriptors: *Hydrophone arrays, *Recording instruments, *Bathymetry, Specifications, Design, Electrical properties, Tolerances(Mechanics), Environmental tests.
Identifiers: *Oceanographic equipment.

The EPC Labs, Inc. Model 4100 Graphic Recorder is a multiapplication recorder designed for shipboard use. It is normally operated as part of an overall bathymetric system. Typical associated equipment includes a hydrophone array and a sound source. Following a tabulation of the manufacturer's specification, information is given on the performance tests made in the Instrumentation Center.

COM-74-11176/6GA PC$4.00/MF$1.45
National Oceanographic Instrumentation Center, Washington, D.C.
ACOUSTIC COMMAND SYSTEM. INTEROCEAN SYSTEMS INC., SAN DIEGO, CALIF. 92110.
Instrument fact sheet.
Feb 74, 18p IFS-74005 NOAA-74051621

Descriptors: *Underwater equipment, *Acoustic equipment, Underwater object locators, Shipboard detectors, Instrument characteristics, Performance evaluation.
Identifiers: *Oceanographic equipment.

The InterOcean Acoustic Command System is designed to provide an acoustic link permitting the marking, locating, and recovery of instrument packages or other items from the sea floor. It consists of shipboard and underwater subsystems. The shipboard equipment consists of a command transmitter, a transponder interrogator, an acoustic receiver, a transducer, and an optional digital range indicator which indicates slant-range between the shipboard receiver and the deployment site. The command transmitter is a portable, DC-operated unit consisting of a programable code generator, a variable-pulse-width transpond generator, a high-power audio amplifier and regulated supplies. The acoustic receiver is a high-gain audio amplifier with meter readout to be used as an aid in locating the underwater equipment and tracking its return to the surface after release.

COM-74-11179/0GA PC$4.00/MF$1.45
National Oceanographic Instrumentation Center, Washington, D.C.
SERIES 8100 TEMPERATURE, SALINITY AND DEPTH SYSTEM. GUIDELINE INSTRUMENTS, INC., LARCHMOUNT, NEW YORK. 10538.
Instrument fact sheet.
Sep 73, 14p IFS-74003 NOAA-74051619

Descriptors: *Temperature measuring instruments, *Profilometers, *Depth detectors, Specifications, Conductivity, Salinity, Electrical properties, Tolerances(Mechanics), Design, Performance evaluation, Environmental tests.
Identifiers: *Oceanographic equipment.

The Guideline Series 8100 Temperature, Salinity, and Depth System consists of a Model 8203A2 Probe and a Model 8105C4 Control Unit. The equipment is designed to obtain continuous profiles of ocean temperature and conductivity (salinity) as a function of depth. Information is given on the performance tests made in the Instrumentation Center.

COM-74-11182/4GA PC$4.00/MF$1.45
National Oceanographic Instrumentation Center, Washington, D.C.
MODEL RS6 CONDUCTIVITY TEMPERATURE AND DEPTH INDICATOR. BECKMAN INSTRUMENTS, INC., CEDAR GROVE, NEW JERSEY. 07009.
Instrument fact sheet.
Apr 72, 14p IFS-72005 NOAA-74051606

Descriptors: *Measuring instruments, *Sensor characteristics, Temperature measuring instruments, Conductivity, Depth detectors, Potentiometers(Instruments), Salinity, Performance evaluation, Specifications, Design, Tolerances(Mechanics), Acceptability, Electrical properties, Bays, Estuaries.
Identifiers: *Oceanographic equipment.

The fact sheet reports on a particular model of a conductivity temperature and depth indicator. The model is designed primarily for use in shallow coastal waters, bays, and estuaries where large salinity and temperature changes occur. Following a tabulation of the manufacturer's performance specifications, information is given on the performance tests made in the Instrumentation Center.

COM-74-11184/0GA PC$4.00/MF$1.45
National Oceanographic Instrumentation Center, Washington, D.C.
MODEL 735 DISSOLVED OXYGEN ANALYZER. BECKMAN INSTRUMENTS, INC., FULLERTON, CALIFORNIA. 92634.
Instrument fact sheet.
Sep 72, 13p IFS-73003 NOAA-74051609

Descriptors: *Dissolved gases, *Oxygen, *Measuring instruments, Fresh water, Performance evaluation, Water quality.
Identifiers: *Oceanographic equipment.

The Beckman Model 735 Dissolved Oxygen Analyzer is designed to continuously measure the concentration of dissolved oxygen in shallow fresh water. The instrument consists of a sensor that detects the partial pressure of oxygen present and a terminal unit that converts the resulting signal to a reading in parts per million by weight of dissolved oxygen in chloride-free water. Following a tabulation of the manufacturer's performance specifications, information is given on the performance tests made in the Instrumentation Center.

COM-74-11185/7GA PC$4.00/MF$1.45
National Oceanographic Instrumentation Center, Washington, D.C.
MODEL 200 ACOUSTIC COMMAND SYSTEM. AMERICA MACHINE AND FOUNDRY COMPANY, ALEXANDRIA DIVISION, ALEXANDRIA, VIRGINIA. 22314.
Instrument fact sheet.
Mar 71, 13p IFS-71009 NOAA-74051630

Descriptors: *Underwater equipment, *Acoustic equipment, *Release mechanisms, Remote control, Control equipment, Instrument characteristics, Performance evaluation, Command guidance.
Identifiers: *Oceanographic equipment.

Designed for remote control and monitoring applications in oceanographic environments to depths of 20,000 feet (6096 meters), the AMF Model 200 Acoustic Command System consists of a shipboard command unit and an acoustically operated underwater release device. Buoyant subsurface instrument arrays, usually restrained by expendable weights, can be retrieved by locating the approximate site of implantation and transmitting a command which effects release from the weight, allowing the array to float to the surface. A timer module is incorporated to provide an alternative method of activating the anchor release system in the event of acoustic command failure. The transducers of both the shipboard system and the submerged unit are used for projection and detection of acoustic signals. Following a tabulation of the manufacturer's performance specifications, information is given on the performance tests made in the Instrumentation Center.

JPRS-62181 PC$3.00/MF$1.45
Joint Publications Research Service, Arlington, Va.
SOME RESULTS OF INVESTIGATION OF THE NATURAL ELECTRICAL FIELD AT SEA,
V. I. Lopatnikov. 6 Jun 74, 10p
Trans. of Voprosy Fiziki Morya (USSR) v37 p154-162 1966.

Descriptors: *Black Sea, *Electric fields, Sea water, Translations, USSR.

The report contains results of observations of the electrical field in the sea from a stationary installation near the shore line of the Black Sea.

N74-22034/4GA PC$6.25/MF$1.45
Old Dominion Univ. Research Foundation, Norfolk, Va.
THE APPLICATION OF LASER-RAMAN LIGHT SCATTERING TO THE DETERMINATION OF SULFATE IN SEA AND ESTUARINE WATERS.
Final Technical Report.
A. R. Bandy. Aug 73, 65p NASA-CR-138124
Contract NGR-47-003-071

Descriptors: *Estuaries, *Raman lasers, *Raman spectra, *Sea water, *Sulfates, Concentration (Composition), Nitrates, Statistical analysis.

For abstract, see STAR 1213

N74-22059/1GA PC$4.75/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
ESTIMATION OF SUNLIGHT PENETRATION IN THE SEA FOR REMOTE SENSING.
W. R. Mccluney. Apr 74, 31p NASA-TM-X-70643, X-913-74-113

Descriptors: *Multispectral band scanners, *Sea water, *Sunlight, Earth resources technology satellite 1, Penetration, Turbidity, Water resources.

For abstract, see STAR 1213

8K. Seismology

AD-780 657/3GA PC$4.50/MF$1.45
California Inst of Tech Pasadena Seismological Lab
SEISMIC PHENOMENA CONNECTED WITH EARTHQUAKES AND EXPLOSIONS.
Semi-Annual technical rept. 15 Mar-14 Sep 73,
David G. Harkrider. 14 Sep 73, 123p AFOSR-TR-74-0854
Contract F44620-72-C-0078, ARPA Order-1827
See also Semi-annual technical rept., 15 Oct 72-14 Mar 73, AD-765 664.

Descriptors: *Earthquakes, *Underground explosions, *Seismic waves, Earth mantle, Earth crust, Rayleigh waves, Surface waves, Nevada, Arizona, Structural geology.

Contents:
Abstracts of publications and reports during this contract period;
Time functions appropriate for deep earthquakes;
Interpretation of body and Rayleigh waves from NTS to Tucson;
Numerical applications of the expanding spherical rupture and the unilateral propagating spherical rupture in a prestress field of pure shear.

AD-780 686/2GA PC$4.00/MF$1.45
Army Engineer Waterways Experiment Station Vicksburg Miss
STATE OF THE ART FOR ASSESSING EARTHQUAKE HAZARDS IN THE UNITED STATES. REPORT 2. FAULT ASSESSMENT IN EARTHQUAKE ENGINEERING,
Ellis L. Krinitzsky. May 74, 91p Rept no. AEWES-Misc-Paper-S-73-1-2

Descriptors: *Earthquakes, *Faults(Geology), *United States, Hazards, Assessment.
Identifiers: *Earthquake engineering.

Earthquakes of engineering interest are normally considered to result only from slippage or movement along existing faults. Hence, the detection of existing faults and their assessment as active or inactive constitutes an essential aspect of earthquake design. Some faults in soft sediments, though active, may not have the capability of generating earthquakes and must be so interpreted. Active faults generally may be evaluated for their maximum capacity to generate earthquakes through a synthesis of the local geologic and seismic history and worldwide relationships betweeen fault dimensions and earthquakes. Major earthquakes are caused by slippage along large faults, which are unlikely to be missed in detailed geologic investigation for sites in western United States. This may not be the case in the central and eastern United States. Small faults may be missed in any investigation so that a floating earthquake of limited size must be assumed to account for them. Where faulting is not manifest at the surface, seismic history and geologic investigation can define geographic limits or zones for which floating earthquakes of various sizes are assigned. (Author)

JPRS-62075 PC$3.00/MF$1.45
Joint Publications Research Service, Arlington, Va.
METHODOLOGICAL PLAN FOR AERIAL SEISMIC STUDIES AT SEA AND IN THE OPEN OCEAN,
S. V. Potapev, G. G. Beletskii, and I. I. Levin. 23 May 74, 11p
Trans. of Geologiya i Geofizika (USSR) n11 p102-107, 1973.

Descriptors: *Seismic surveys, *Oceans, Aerial surveys, Translations, USSR.

The report contains a plan for aerial observations by the registry of oscillations by means of marine telemetric autonomous radio buoys outfitted with aircraft guidance and detection instrumentation.

PB-233 257/5GA PC$14.75/MF$1.45
California Inst. of Tech., Pasadena. Earthquake Engineering Research Lab.
STRONG-MOTION EARTHQUAKE ACCELEROGRAMS DIGITIZED AND PLOTTED DATA. VOLUME II. CORRECTED ACCELEROGRAMS AND INTEGRATED GROUND VELOCITY AND DISPLACEMENT CURVES. PARTS J AND K. ACCELEROGRAMS IIJ141 THROUGH IIJ150 AND IIK157 THROUGH IIK168.
M. D. Trifunac, A. G. Brady, and D. E. Hudson.
Feb 74, 232p EERL-74-52
Grant NSF-GK-28098
See also PB-232 316.

Descriptors: *Earthquakes, *Seismic waves, *Dynamic structural analysis, Accelerometers, Digital recording, Power spectra, Velocity measurement, Corrections, Printout, Tables(Data), California.
Identifiers: San Fernando earthquake, Earthquake engineering, Ground motion.

The first set of 20 corrected earthquake accelerograms was published in September 1971, as Vol. II, Part A, Report No. EERL 71-50, the first report of the Vol. II series. That issue also contained introductory material and background information describing the types of corrections used. The corresponding uncorrected data appeared earlier in Vol. I, Part A, Report No. EERL 70-20. Both of these reports, containing references related to the records themselves and the various procedures, should be referred to by all users of the data. This issue, Vol. II, Parts J and K, Report No. EERL 74-52, continues with the accelerograms obtained during the San Fernando earthquake of February 9, 1971, and includes four records from the Lake Hughes array, three records each from the buildings at 15107 Vanowen Street and 616 S. Normandie Avenue, and two records each from the buildings at 420 S. Grand Avenue and 750 Garland Avenue, all in Los Angeles.

RT/PROT-(73)29 PC$4.25/MF$1.45
Comitato Nazionale Per l'Energia Nucleare, Rome (Italy). Div. Sicurezza E Controlli.
DESCRIPTION OF THE PROGRAM CFRS.
L. Lazzeri. 11 Oct 73, 23p
In Italian.

Descriptors: (*Computer codes, *C codes), (*Buildings, *Mechanical vibrations), Earthquakes.

For abstract, see NSA 30 01, number 02404.

8L. Snow, Ice, and Permafrost

AD-780 694/6GA PC$3.00/MF$1.45
Cold Regions Research and Engineering Lab Hanover N H
LABORATORY PREPARATION OF ARTIFICIAL SEA AND SALT ICE.
Special rept.,
W. F. Weeks, and G. F. N. Cox. Jun 74, 15p Rept no. CRREL-SR-206

Descriptors: *Sea ice, Synthesis, Sodium chloride, Freezing, Salinity, Grain size, Orientation(Direction), Single crystals.
Identifiers: Brines.

The characteristics of several successful schemes that have been used to produce artificial sea and salt ice for laboratory studies are described. Difficulties that have been encountered in developing suitable experimental designs for investigating a variety of specific sea ice problems (salinity, grain size, substructure and orientation variations; preparation of single crystals and underwater ice) are discussed and suggestions are given for improved methods. (Author)

N74-22045/0GA PC$4.00/MF$1.45
Scientific Translation Service, Santa Barbara, Calif.
RADIATION TEMPERATURES OF THE EARTH'S MANTLE IN THE SUPERHIGH FREQUENCY AND INFRARED REGIONS BASED ON DATA FROM AN EXPERIMENT ON THE ARTIFICIAL EARTH SATELLITE COSMOS-384.
A. Y. Basharinov, A. K. Gorodetskiy, A. S. Gurvich, S. T. Yegorov, and A. A. Kurskaya. Jul 73, 11p NASA-TT-F-14734
Contract NASW-2483
Tran-Transl. Into English from Izv. Akad. Nauk Sssr, Fiz. Atmos. Okeana (Usar), Vol. 9, No. 2, 1973 p 183-186.

Descriptors: *Africa, *Antarctic regions, *Cosmos satellites, *Radiation measurement, Brightness temperature, Earth mantle, Infrared radiation, Superhigh frequencies.

For abstract, see STAR 1213

8M. Soil Mechanics

PB-233 119/7GA PC$3.25/MF$1.45
New Mexico Agricultural Experiment Station, University Park.
SOIL ASSOCIATIONS AND LAND CLASSIFICATION FOR IRRIGATION, TAOS COUNTY.
Research rept.,
H. J. Maker, J. J. Folks, and J. U. Anderson. 1974, 46p RR-268 W74-09054, OWRR-B-015-NMEX(24)

Descriptors: *Soil properties, *Irrigated land, *New Mexico, Soil classification, Investigations, Soil surveys, Agriculture, Land use, Maps.
Identifiers: *Taos County(New Mexico).

Information is presented on the suitability of soils in Taos County, NM., for irrigation. The acreage, general location, and relative capability of the soils for use in irrigated agriculture are given. The general soil map and a detailed soil survey provided the information necessary for the classification for irrigation. The data were organized and presented on the basis of soil associations shown on the general soil map and on the irrigation land classification map. Taos County has about 1,444,500 acres, of which about 29% were considered suitable for irrigation. Information is provided on soil resources that can be used for preliminary planning for irrigated agriculture, forestry, range, urban, engineering, recreation, and wildlife uses. A general soil map and a classification of land for irrigation map, both in color are included.

PB-233 120/5GA PC$3.75/MF$1.45
New Mexico Agricultural Experiment Station, University Park.
SOIL ASSOCIATIONS AND LAND CLASSIFICATION FOR IRRIGATION, VALENCIA COUNTY.
Research rept.,
H. J. Maker, C. W. Keetch, and J. U. Anderson. Feb 74, 74p RR-267 W74-09057, OWRR-B-015-NMEX(23)

Descriptors: *Soil properties, *Irrigated land, *New Mexico, Soil classification, Investigations, Soil surveys, Agriculture, Land use, Maps.
Identifiers: *Valencia County(New Mexico).

Information is presented on the suitability of soils in Valencia County, NM., for irrigation. The acreage, general location, and relative capability of the soils for use in irrigated agriculture are given. The general soil map based on a reconnaissance soil survey and limited detailed soil surveys provided the information necessary for the classification for irrigation. The data were organized and presented on the basis of soil associations shown on the general soil map and on the irrigation land classification map. Valencia County has about 3,621,000 acres, of which about 38% were considered suitable for irrigation. Information is provided on soil resources that can be used for preliminary planning for irrigated agriculture, forestry, range, urban, engineering, recreation, and wildlife uses. A general soil map and a classification of land for irrigation map, both in color, are included.

PB-233 121/3GA PC$3.75/MF$1.45
New Mexico Agricultural Experiment Station, University Park.
SOIL ASSOCIATION AND LAND CLASSIFICATION FOR IRRIGATION, MCKINLEY COUNTY.
Research rept.,
H. J. Maker, H. E. Bullock, Jr., and J. U. Anderson. Jan 74, 70p RR-262 W74-09056, OWRR-B-015-NMEX(22)

Descriptors: *Soil properties, *Irrigated land, *New Mexico, Soil classification, Investigations, Soil surveys, Agriculture, Land use, Maps.
Identifiers: *McKinley County(New Mexico).

Information is presented on the suitability of soils in McKinley County, NM., for irrigation. The acreage, general location, and relative capability of the soils for use in irrigated agriculture are given. The general soil map based on a reconnaissance soil survey and limited detailed soil surveys provided the information necessary for the classification for irrigation. The data were organized and presented on the basis of soil associations shown on the general soil map and on the irrigation land classification map. McKinley County has about 3,495,000 acres, of which about 42% were considered suitable for irrigation. Information is provided on soil resources that can be used for preliminary planning for irrigated agriculture, forestry, range, urban, engineering, recreation, and wildlife uses. A general soil map and a classification of land for irrigation map, both in color, are included.

PB-233 122/1GA PC$3.25/MF$1.45
New Mexico Agricultural Experiment Station, University Park.
SUITABILITY OF NEW MEXICO LANDS FOR IRRIGATION.
Research rept.,
J. U. Anderson, and H. J. Maker. Mar 74, 36p RR-276 W74-09055, OWRR-B-015-NMEX(25)

Descriptors: *Soil properties, *Irrigated land, *New Mexico, Soil classification, Investigations, Soil surveys, Agriculture, Land use, Maps.

Results are summarized of a study which was conducted to obtain the extent, nature, and distribution of irrigable land in New Mexico. Irrigation land classes were assigned to soils on the basis of data obtained from various published and unpublished detailed and reconnaissance soil surveys. The data were organized and presented on the basis of soil associations. New Mexico has about 77,866,400 acres, of which about 41% were considered suitable for irrigation. Information is provided on soil resources to be used for preliminary planning for irrigated agriculture, forestry, range, urban, engineering, recreation and wildlife use. A general suitability map prepared from the county irrigation land classification maps of the 31 county reports previously published is included.

8N. Terrestrial Magnetism

N74-22027/8GA PC$4.50/MF$1.45
Kyoto Univ. (Japan).
CATALOGUE OF DATA IN THE WORLD DATA CENTRE C2 FOR GEOMAGNETISM, MARCH 1974.
Mar 74, 30p

Descriptors: *Geomagnetism, *Magnetic surveys, *World data centers, Catalogs (Publications), Magnetic anomalies, Magnetic signatures, Tables (Data).

For abstract, see STAR 1213

N74-22039/3GA PC$15.00/MF$1.45
Instituto Geografico y Catastral, Madrid (Spain).
ANNUAL OF SERVICES FOR GEOMAGNETISM AND AERONOMY FOR 1971 ANUARIOS DEL SERVICIO DE GEOMAGNETISMO Y AERONOMIA: ANO 1971.
1973, 239p
Language in Spanish.

Descriptors: *Geomagnetism, *Spain, Diurnal variations, Magnetic anomalies, Magnetic surveys, Tables (Data), Variometers.

For abstract, see STAR 1213

N74-22040/1GA PC$4.00/MF$1.45
National Aeronautics and Space Administration, Washington, D.C.
SOME CURRENT SYSTEMS IN THE NEAR-POLAR REGION.
P. V. Sumaruk, and Y. I. Feldshteyn. Dec 73, 12p
NASA-TT-F-14792
Tran-Transl. Into English from Acad. Of Sci. Ussr Preprint No. 13 (Moscow) 1973 21 Pp.

Descriptors: *Arctic regions, *Geomagnetic pulsations, *Geomagnetism, *Magnetic surveys, Data acquisition, Data processing, Magnetic anomalies, Mapping.

For abstract, see STAR 1213

N74-22104/5GA PC$4.00/MF$1.45
Department of Energy, Mines and Resources, Ottawa (Ontario). Earth Physics Branch.
COMPACT BIAS COIL SYSTEMS FOR GEOMAGNETIC MEASUREMENTS,.
Publications of the Earth Physics Branch, Volume 44, No. 10.
P. H. Serson. 1974, 8p

Descriptors: *Coils, *Magnetic measurement, *Magnetometers, Equipment specifications, Instrument errors, Magnetic fields.

For abstract, see STAR 1213

9. ELECTRONICS AND ELECTRICAL ENGINEERING

9A. Components

AD-780 536/9GA PC$3.75/MF$1.45
State Univ of New York Buffalo
SUSCEPTIBILITY OF UHF RF TRANSISTORS TO HIGH POWER UHF SIGNALS.
Interim rept. Jul 72-Jun 73,
Hollis J. Hewitt, and James J. Whalen. May 74, 61p RADC-TR-74-123
Contract F30602-72-C-0415

Descriptors: *Transistors, Radiation effects, Ultrahigh frequency, High power, Microwaves, Continuous waves, Bipolar transistors, Silicon, Electromagnetic radiation, Vulnerability.

The report describes a program that was initiated to determine what effects high power UHF/microwave signals have upon solid state components such as transistors used in RF amplifier stages of UHF/microwave receivers. The effects of CW power at 200 MHz upon the following transistor parameters were monitored: (1) small signal power gain; (2) noise figure; (3) breakdown voltages; (4) leakage currents; (5) Beta (hFE). The one parameter that did degrade significantly when CW UHF power was applied was the dc current gain Beta. A change in Beta from an initial value of 60 to a value of 15 after exposure is a representative case. These changes in Beta occur at incident power levels significantly below that required to cause component failure. The parameter Beta is a good parameter to monitor during CW EMV investigations. (Modified author abstract)

AD-780 595/5GA PC$4.00/MF$1.45
Hughes Research Labs Malibu Calif
CROSSED-FIELD CLOSING-SWITCH DEVELOPMENT.
Final rept. 10 May-9 Nov 73,
M. A. Lutz, and H. Alting-Mees. Apr 74, 93p
AFWL-TR-73-294
Contract F29601-73-C-0103

Descriptors: *Electric switches, High voltage, Crossed field devices, Electric arcs, Plasmas(Physics), Direct current.

The basic objective of the program was to determine the feasibility of using a novel type of spark-

gap switch called a cross-field closing switch for applications at the 60-kV, 20-kA, 20-microsec level. This entailed single-shot testing at these levels to determine the following critical items: (1) anode fall time, (2) ignition jitter, (3) voltage recovery rate, (4) gas cleanup rate, (5) arc uniformity, and (6) triggering and control levels. A second objective of this program was to design a cross-field closing switch to operate at the above levels, but at a repetition rate of 250 Hz, that gave an average switch current of 100 A. The experimental program proved the feasibility of the tube on a single-shot basis. (Modified author abstract)

AD-780 703/5GA PC$3.00/MF$1.45
IBM Thomas J Watson Research Center Yorktown Heights N Y
MAGNETIZATION SWITCHING IN A MAGNETO-OPTIC THIN FILM.
Quarterly technical rept., no. 4, 1 Nov-31 Dec 73,
James M. White, and S. C. Tseng. Jun 74, 25p
Contract N00014-73-C-0256, ARPA Order-2327
See also Quarterly technical rept. no. 2, AD-769 132.

Descriptors: *Waveguides, *Magnetooptics, Garnet, Iron compounds, Gallium compounds, Gadolinium compounds, Thin films, Modulation, Gallates, Yttrium iron garnet.
Identifiers: Optical waveguides, Magnetic films.

An improved technique for observing subnanosecond magnetization changes in thin films has been used to study the underdamped oscillatory behavior in a (Y(2.5)Gd(.5))Fe4Ga1)O12 sample. The measurement set-up uses a version of the alternate sampling technique in which the sensitivity has been upgraded by the use of a lock-in amplifier. By using a shorted strip-line of appropriate length to apply to the film two properly timed magnetic field steps, the precession of the magnetization can be quelled, and the magnetization can be switched between initial and final directions in a half-cycle of the resonant frequency. (Author)

AD-780 714/2GA PC$3.00/MF$1.45
Army Missile Command Redstone Arsenal Ala Guidance and Control Directorate
INDUCTANCES OF FOLDED FOIL CONFIGURATIONS.
Technical rept.,
J. Darryl Holder. Apr 74, 15p Rept no. RG-74-8

Descriptors: *Electric switches, Foils(Materials), Folding, Electric shunts, Inductance, Explosions, Resistors, Transmission lines.
Identifiers: *Exploding foils.

The purpose of the work was to explore the methods for construction of low-inductance exploding foil packages. The conducting media was 0.001-inch aluminum foil and was folded accordian-pleat fashion with dielectric sheets interleaved to produce a compact switch package that may be placed between the conductors of a parallel-plate transmission line. The results of this study shown good fit of measured foil package inductances with the expected behavior and imply that it is indeed possible to use foils of long length in low-inductance imply that it is indeed possible to use foils of long length in low-inductance circuits. (Author)

AD-780 861/1GA PC$3.00/MF$1.45
Raytheon Co Waltham Mass Special Microwave Devices Operation
MILLIMETER WAVE AVALANCHE TRANSIT TIME DIODE AMPLIFIER.
Quarterly rept. no. 3, 1 Jan-31 Jan 73,
R. Fekete. May 74, 19p Rept nos. SM-385, Micro State-0573-740 ECOM-0228-3-72
Contract DAAB07-72-C-0228

Descriptors: *Avalanche diodes, *Power amplifiers, Microwave amplifiers, Millimeter waves, Gallium arsenides.

During this period, the fabrication of millimeter-wave diodes from selected GaAs wafers continued. The devices were evaluated as oscillators and their maximum output power and oscillation frequency was measured. Design of the millimeter-wave ADA has been started. Preliminary design of the circulators for the ADA has been completed, and the first unit has been built. (Author)

AD-780 872/8GA Reprint
Air Force Cambridge Research Labs L G Hanscom Field Mass
DIFFRACTION COMPENSATION IN PERIODIC APODIZED ACOUSTIC SURFACE WAVE FILTERS,
Thomas L. Szabo, and Andrew J. Slobodnik, Jr. 1 Jan 74, 8p Rept no. AFCRL-TR-74-0261
Revision of report dated 16 Oct 73.
Availability: Pub. in IEEE Transactions on Sonics and Ultrasonics, vSU21 n2 p114-119 Apr 74.

Descriptors: *Acoustic filters, *Diffraction, Surface waves, Acoustic waves, Band pass filters, Lithium compounds, Tantalum compounds, Beam steering, Transmission loss.
Identifiers: *Acoustic surface waves, *Microwave acoustics, Lithium tantalates.

Straightforward analytic synthesis techniques are derived for correcting for diffraction in periodic acoustic surface wave filters having one apodized transducer. The usual condition that the transducer be accurately modeled by a transversal filter is required. Quantitative experimental verification of the synthesis procedure is provided for a filter fabricated on lithium tantalate and having a center frequency of 340 M Hz. General design curves are presented in order to illustrate the magnitude of the correction required under a variety of conditions as well as several general properties of diffraction correction. Analytic expressions for the calculation of beam steering and diffraction loss for general unequal acoustic apertures are derived in an Appendix. (Author)

AD-780 873/6GA Reprint
Air Force Cambridge Research Labs L G Hanscom Field Mass
DESIGN OF OPTIMUM ACOUSTIC SURFACE WAVE DELAY LINES AT MICROWAVE FREQUENCIES,
Andrew J. Slobodnik, Jr., and Thomas L. Szabo. 4 Sep 73, 7p Rept no. AFCRL-TR-74-0257
Revision of report dated 28 Jun 73.
Availability: Pub. in IEEE Transactions on Microwave Theory and Techniques, vMTT22 n4 p458-462 Apr 74.

Descriptors: *Acoustic delay lines, *Microwave equipment, Microwave frequency, Beam steering, Diffraction, Transmission loss.
Identifiers: *Acoustic surface waves, *Microwave acoustics, Design, Interdigital transducers.

Optimum procedures for designing microwave acoustic surface wave delay lines are given. Combined beam steering diffraction loss curves are provided as a function of the basic material parameter, the slope of the power flow angle, to allow optimum choice of material for a given application. Methods for designing uniform periodic interdigital transducers including finger ohmic loss, lossy tuning elements, and parasitic capacitance have been extended to account for beam steering and diffraction. (Author)

AD-781 020/3GA Not available NTIS
Post Office Research Dept London (England)
A STUDY OF THE POWER HANDLING ABILITY OF GALLIUM ARSENIDE AND SILICON, SINGLE AND DOUBLE DRIFT IMPATT DIODES,
S. O'Hara, and J. R. Grierson. 25 Jun 73, 19p Rept no. 362 DRIC-BR-41065
Revision of report dated 23 Mar 73.
Availability: Pub. in Solid-State Electronics, v17 p137-153 1974.

Descriptors: *IMPATT diodes, Gallium arsenides, Silicon, Electric current, Power, Great Britain.
Identifiers: Current density.

The concept of a critical current density effect on the operation of silicon and gallium arsenide IMPATT diodes is examined using large signal analysis. This critical current density effect does not appear to exist in the form that is generally thought of to-date. However, other physical processes develop at high current densities which gradually degrade diode efficiencies. These processes are worse in silicon diodes than in gallium arsenide diodes because at a given frequency of operation silicon diodes need a lower doping density than gallium arsenide diodes due to the lower saturated drift velocities of carriers in gallium arsenide. Reasons are suggested which explain why these other processes develop before a true critical current density limit is seen. (Modified author abstract)

AD-781 029/4GA PC$4.00/MF$1.45
Army Foreign Science and Technology Center Charlottesville Va
THE USE OF VARIOUS CONTACT MATERIALS FOR CURRENT COLLECTION,
V. P. Koltsov. Sep 73, 10p Rept no. FSTC-HT-23-125-74
Trans. of Issledovaniya Ustroistv Kontaktnoi Seti i Tokopriemnikov (USSR) n414 p47-53 1969.

Descriptors: *Electric contacts, Wear, Materials, Cermets, Carbon, Railroads, Locomotives, Translations, USSR.

DC electric locomotives should be equipped with metal ceramic contact plates and carbon inserts. Metal ceramic plates should be installed on the ChS2, VL22, VL82 and VL10 locomotives, as well as the VL8 in mountainous areas, where currents are heavy. All other dc electric locomotives should be equipped with carbon inserts. The conversion of the dc locomotives to metal ceramic plates and carbon inserts can reduce contact wire wear by a factor of 2-2.5 and avoid the use of copper contact plates with SGS-O dry graphite lubrication.

AD-781 071/6GA Reprint
New York Univ N Y Courant Inst of Mathematical Sciences
WAVE-PACKET SPREADING ON A RANDOM TRANSMISSION LINE.
Interim rept.,
Ioannis M. Besieris, and Frederick D. Tappert. 10 Aug 72, 5p AFOSR-TR-74-0852
Grant AF-AFOSR-2107-71
Prepared in cooperation with Bell Lab., Whippany, N.J.
Availability: Pub. in Jnl. of Applied Physics, v44 n5 p2119-2121 May 73.

Descriptors: *Transmission lines, Attenuation, Pulses, Propagation, Stochastic processes.

Quantitative predictions are made of the spreading and attenuation of a single forward-propagating wave packet on a random, dissipative, and dispersive transmission line modeled by a generalized telegraphist's equation with slowly varying random coefficients. (Author)

AD-781 102/9GA PC$3.25/MF$1.45
Massachusetts Inst of Tech Lexington Lincoln Lab
INTEGRATED OPTICAL CIRCUITS.
Semiannual technical summary, 1 Jul-31 Dec 73,
Charles M. Wolfe, Gregory E. Stillman, David L. Spears, and Ivars Melngailis. 31 Dec 73, 30p ESD-TR-74-172
Contract F19628-73-C-0002, ARPA Order-2074
See also AD-769 858.

Descriptors: *Optical equipment, *Integrated circuits, Semiconductors, Gallium arsenides, Indium compounds, Epitaxial growth, Photodiodes, Mercury compounds, Cadmium tellurides, Carbon

dioxide lasers, Infrared lasers, Schottky barrier devices, Waveguides, Acoustooptics.
Identifiers: *Optical waveguides, Indium arsenides, Mercury tellurides.

In(x)Ga(1-x)As avalanche photodiodes have been integrated into GaAs waveguide structures by selective epitaxial deposition. Measurements of the ionization coefficients of electrons (alpha) and holes (beta) have been made for GaAs by using a special type of GaAs Schottky barrier avalanche photodiode structure. A new type of GaAs avalanche photodiode which has considerable advantages for detection at wavelengths up to 0.93 micrometer has been investigated. Significant progress has been made in the vapor epitaxial growth of Hg(1-x)Cd(x)Te on CdTe substrates by H2 transport. High-energy proton bombardment has been used to fabricate waveguides for 10.6 micrometer in CdTe. Coupling of 10.6 micrometer radiation into CdTe waveguides has been explored. The feasibility of integrated surface acoustic wave modulators for 10.6 micrometer has been investigated. (Modified author abstract)

AD-781 125/0GA PC$3.25/MF$1.45
Clarkson Coll of Technology Potsdam N Y
TRANSIENT TEMPERATURE RISE IN FILM RESISTORS.
Technical rept.,
Henry Domingos. Apr 74, 32p RADC-TR-74-92
Contract F30602-72-C-0463

Descriptors: *Resistors, Temperature, Films, Transients, Thermal conductivity.
Identifiers: *Film resistors.

Transient temperature distributions in film resistors are calculated for time intervals ranging from 10 nsec to 100 microsec. A one-dimensional model consisting of substrate, resistive film, and jacket is assumed. Peak temperatures are plotted for various film thicknesses, using thermal properties appropriate for resistors from four manufacturers. (Author)

AD-781 155/7GA PC$4.00/MF$1.45
Army Foreign Science and Technology Center Charlottesville Va
INFLUENCE OF BUILT-IN FIELD HETEROGENEITY ON SEMICONDUCTOR PICKUP EFFICIENCY,
V. M. Evdokimov, and A. F. Milovanov. 20 Mar 74, 20p Rept no. FSTC-HT-23-1851-73
Trans. of Gelioteknika (USSR) n4 p24-35 1972.

Descriptors: *Photoelectric cells(Semiconductor), Efficiency, Photoconductivity, Semiconductor junctions, Photosensitivity, Translations, USSR.

The optimal curvature of the potential of the built-in field of a planar photocell with p-type doped layer n-type base and its effect on the efficiency of doped layer pickup are examined. The photocell is illuminated on the doped layer side. The pickup efficiency maximum was found to depend on the surface recombination rate. In some field configurations the photocell is less sensitive to the rate of surface recombination. The gain in pickup of carriers generated with shortwave radiation, for a particular field configuration, is approximately 50%. (Author)

AD-781 165/6GA PC$4.75/MF$1.45
Florida Univ Gainesville Dept of Electrical Engineering
SOLID STATE MATERIALS AND DEVICES.
Final rept. 1 Sep 72-31 Aug 73,
Fredrik A. Lindholm, Arthur J. Brodersen, Eugene R. Chenette, and Sheng S. Li. 1 Dec 73, 141p AFCRL-TR-74-0044
Contract F19628-72-C-0368, ARPA Order-1060
See also report dated 10 Apr 73, AD-769 962.

Descriptors: *Transistors, Field effect transistors, Phototransistors, Schottky barrier devices, Semiconductor devices, Semiconductor diodes, Integrated circuits, Metal oxide semiconductors, Mathematical models, Transport properties, Radiation effects, Neutron reactions, Noise(Radio), Silicon, Gold, Gallium arsenides, Capacitance.
Identifiers: Carriers(Semiconductors), Equivalent circuits.

Contents:
Transistor circuit models;
Questionability of drift-diffusion transport in the analysis of small semiconductor devices;
The effect of neutron radiation on noise in field-effect transistors;
A new high sensitivity integrated silicon Schottky-barrier phototransistor;
Analyses of transient capacitance experiments for Au-GaAs Schottky barrier diodes in the presence of deep impurities and the interfacial layer;
An evaluation of carrier domain devices for functional integrated circuits.

AD-893 266/7GA PC$5.50/MF$1.45
Southern Methodist Univ., Dallas, Tex. Electronic Sciences Center.
DEVELOPMENT OF SILICON MONOLITHIC SURFACE WAVE ARRAYS.
Final rept. 1 Jul-31 Dec 71,
Jack P. Mize. Mar 72, 49p AFAL-TR-72-59
Contract F33615-72-C-1020
Distribution Limitation now Removed.

Descriptors: *Piezoelectric transducers, *Acoustics, *Rayleigh waves, Generators, Integrated circuits, Field effect transistors, Analog systems, Radar equipment, Communication equipment, Delay lines, Electric fields, Quartz, Lithium compounds, Niobates, Matched filters, Decoding, Waveform generators, Stresses, Capacitors, Substrates, Cost effectiveness, Excitation, Silicon, Oxidation.
Identifiers: *Acoustic waves, *Surface waves, Large scale integrated circuits, Metal oxide semiconductors, Metal oxide transistors, Piezoresistive materials, Signal processing, *Surface waves, *Acoustic surface waves.

The objective of this research is to fabricate silicon device structures capable of generating acoustic surface waves. Realization of this objective would result in silicon programmable surface-wave arrays which would be fully compatible with MOS/LSI technology. The performance and cost effectiveness of MOS/LSI applied to these electronic functions could have a major impact on radar and communication system technology. Silicon is a piezoresistive material, and this property has previously been used in MOSFET surface-wave detection.

BDX-613-1042(Rev.) PC$4.25/MF$1.45
Bendix Corp., Kansas City, Mo. (Usa).
SOLDER SLEEVES.
J. R. Ensor. May 74, 22p
Contract AT(29-1)-613

Descriptors: (*Electric cables, *Soldered joints), (*Sleeves, *Soldering), Economics, Electrical properties, Environment, Fabrication, Mechanical properties, Performance testing, Standards.

For abstract, see NSA 30 01, number 02384.

BDX-613-1067(Rev.) PC$4.25/MF$1.45
Bendix Corp., Kansas City, Mo. (Usa).
INSULATION REMOVAL FROM WOVEN-WIRE TAPE.
R. L. Naney. May 74, 22p
Contract AT(29-1)-613

Descriptors: Chemical reactions, Copper, Cost, Dielectric materials, Electric cables, Electric conductors, Failures, Laser radiation, Polyesters, Residues, Surface cleaning, Wires.

For abstract, see NSA 30 01, number 02315.

BDX-613-1068(Rev.) PC$4.00/MF$1.45
Bendix Corp., Kansas City, Mo. (Usa).
FLEXCIRCUIT PROTECTIVE COATINGS.
R. A. Hile. May 74, 19p
Contract AT(29-1)-613

Descriptors: (*Electric cables, Protective coatings), (*Protective coatings, *Tensile properties), Abrasion, Epoxides, Flexibility, Impact shock, Nylon, Polyurethanes, Thermal cycling.

For abstract, see NSA 30 01, number 02316.

BDX-613-1080 PC$4.25/MF$1.45
Bendix Corp., Kansas City, Mo. (Usa).
CONTROL OF ELECTROSTATIC DAMAGE TO SOLID STATE DEVICES. TECHNOLOGICAL SPINOFF REPORT.
W. J. Jr. Kirk, L. S. Carter, and M. L. Waddell. Mar 74, 24p
Contract AT(29-1)-613

Descriptors: Electric charges, Electrostatics, Personnel, Semiconductor devices.

For abstract, see NSA 30 01, number 02386.

BDX-613-1085(Rev.) PC$4.50/MF$1.45
Bendix Corp., Kansas City, Mo. (Usa).
EFFECT OF RAPIDLY CHANGING VOLTAGES ON THICK-FILM RESISTORS. FINAL REPORT.
A. G. Bennett. May 74, 29p
Contract AT(29-1)-613

Descriptors: (*Resistors, *Performance), Electric conductivity, Electric potential, Electronic circuits.

For abstract, see NSA 30 01, number 02387.

BDX-613-887(Rev.) PC$4.50/MF$1.45
Bendix Corp., Kansas City, Mo. (Usa).
REMOVAL OF INSULATION FROM MULTICONDUCTOR WIRE TAPE USING A CARBON DIOXIDE LASER.
R. T. Horn. May 74, 26p
Contract AT(29-1)-613

Descriptors: Carbon dioxide, Dielectric materials, Electric conductors, Electrical equipment, Laser-radiation heating, Maintenance.

For abstract, see NSA 30 01, number 02381.

BDX-613-992 PC$6.50/MF$1.45
Bendix Corp., Kansas City, Mo. (Usa).
FERRITE-CORE TRANSFORMER BONDING AND POTTING. FINAL REPORT.
W. J. Kirk. Jan 74, 66p
Contract AT(29-1)-613

Descriptors: (*Transformers, *Fabrication), Bonding, Ferrite.

For abstract, see NSA 30 01, number 02382.

N74-21853/8GA PC$4.25/MF$1.45
Kanner (Leo) Associates, Redwood City, Calif.
DESIGN AND MECHANISM ON AN AUTOCATHODE.
H. Bessling. Apr 74, 24p NASA-TT-F-15565, DLR-FB-72-73
Contract NASW-2481
Tran-Transl. Into English of "Aufbau und Funktion Einer Autokathode" Dfvlr, Inst. Fuer Energiewandlung und Elek. Antriebe, Stuttgart, Dlr-FB-72-73, 1972 p 7-27.

Descriptors: *Cathodes, *Electron emission, Field emission, Ion currents, Ion density (Concentration), Performance tests, Tables (Data).

For abstract, see STAR 1213

N74-21855/3GA PC$4.00/MF$1.45
Princeton Univ. Observatory, N.J.
DEVELOPMENT AND EVALUATION OF TELEVISION TUBES FOR SPACE ASTRONOMY.
Final Report.
L. Spitzer. 10 May 74, 12p NASA-CR-138169
Contract NSR-31-001-127

Descriptors: *Spaceborne astronomy, *Television transmission, *Vidicons, Astronomical photography, Equipment specifications, Image tubes, Photocathodes, Preamplifiers.

For abstract, see STAR 1213

PAT-APPL-464 721 PC$4.00/MF$1.45
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
METHOD OF DETERMINING BOND QUALITY OF POWER TRANSISTORS ATTACHED TO BED SUBSTRATES.
Patent Applications.
T. A. Telfer. Filed 26 Apr 74, 11p NASA-CASE-MFS-21931-1,
Subm-Sponsored by NASA.
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Joints(Junctions), *Junction transistors, *Microstructure, *X ray inspection, Nondestructive tests, *Patent applications, Quality control, Structural stability, Substrates.

A non destructive method is reported for testing the bond quality of transistor heat sink bonds by X-ray examination of the bond. The bond is X-ray photographed and the photograph is subjected to analysis by a light meter system to determine the percentage of voids in the bond. Void areas approaching 20% of the bond area can be tolerated if they are scattered. For repeatable results, X-ray of identical assemblies must be taken at identical machine settings. Since it is possible for lack of bonding not to show on an X-ray if the molten preform has conformed exactly to the bottom of the chip, the zing test for wetting should be used in conjuction with the X-ray test.

PATENT-3 801 202 Not available NTIS
Department of the Air Force Washington D C
STABILIZED, OPTIMIZABLE, GASEOUS ELECTRICAL DISCHARGE.
Patent.
Onezine P. Breaux. Filed 23 Aug 72, patented 2 Apr 74, 9p Rept nos. PAT-APPL-283 017,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Cathodes(Electron tubes), *Patents, Discharge tubes, Cathode ray tubes, Gas lasers.
Identifiers: PAT-CL-356-85, Thermionic emmiters.

The field of this invention is in the art of thermionic cathodes and more particularly that of thermionic cathodes for gaseous lasers and electric discharge gas analyzers. The patent describes a gaseous electrical discharge system having a stabilized, controllable thermionic cathode for feeding electrons of optimizable energy content into a gas plasma.

PATENT-3 806 756 Not available NTIS
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
IMAGE TUBE.
Patent.
K. L. Hallam, and C. B. Johnson. Patented 23 Apr 74, 6p NASA-CASE-GSC-11602-1,
Misc-Filed 16 Oct. 1972 Supersedes N73-13214 (11 - 04, p 0395). Subm-Sponsored by NASA.
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Electron beams, *Image tubes, Electrodes, *Patents, Photocathodes, Planar structures.

An optical image is projected onto a planar surface of a photocathode that derives an electron beam replica of the image. A target electrode displaced relative to the photocathode so that it does not obstruct the optical image includes a planar surface for receiving and deriving an accurate replica of the electron beam image. The two planar surfaces are parallel. The electron beam image is focused on the target electrode by providing throughout a region that extends between the planar surfaces of the photocathode and receiving electrode, constant homogeneous dc electric and magnetic fields. The electric field extends in a direction perpendicular to the planar surfaces while the magnetic field extends along a straight line that intersects the photocathode and target electrode at an acute angle.

SLA-73-1045 PC$4.00/MF$1.45
Sandia Labs., Albuquerque, N.Mex. (Usa).
EFFECT OF SOLDERING FLUX ON TA SUB 2 N RESISTORS.
G. J. Hof. Apr 74, 18p
Contract AT(29-1)-789

Descriptors: (*Tantalum nitrides, *Resistors), Microelectronic circuits, Soldered joints, Soldering, Stability.

For abstract, see NSA 30 01, number 02364.

SLA-74-93 PC$4.00/MF$1.45
Sandia Labs., Albuquerque, N.Mex. (Usa).
TECHNIQUE FOR TESTING THE TENSILE STRENGTH OF THERMOCOMPRESSION BONDS.
G. A. Carlson. Mar 74, 20p
Contract AT(29-1)-789

Descriptors: (*Connectors, *Tensile properties), Bonding, Compression, Deposition, Electrical equipment, Electron beam melting, Gold alloys, Heating, Lead, Performance testing, Plasticity, Substrates.

For abstract, see NSA 30 01, number 02417.

9B. Computers

AD-780 530/2GA PC$3.00/MF$1.45
Mitre Corp Bedford Mass
AN INTERACTIVE DEBUGGER FOR SOFTWARE AND FIRMWARE.
M. Gasser. May 74, 21p ESD-TR-74-114
Contract F19628-73-C-0001

Descriptors: *Microprogramming, *Minicomputers, Memory devices, Input output processing, Control sequences, Instruction manuals.
Identifiers: *Debugging(Computers).

A program for interactively debugging software and firmware on an Intercomputer i-50 minicomputer is described. Two processors sharing a common memory are used. The debugger is controlled by standard firmware in one processor, and the firmware and software to be debugged run under the other processor. By inserting a small defined routine into the firmware to be debugged, the debugger has control of the other processor, yet is practically invisible to it. (Author)

AD-780 653/2GA PC$3.25/MF$1.45
Texas Univ Austin Electronics Research Center
TWO-DIMENSIONAL DIGITAL FILTERING AND ITS ERROR ANALYSIS.
Technical rept.,
Ming-Duenn Ni, and J. K. Aggarwal. 15 Mar 74, 49p Rept no. TR-157 AFOSR-TR-74-0897
Grants AF-AFOSR-2371-72, NSF-GK-42790

Descriptors: *Digital filters, *Signal processing, Fourier transformation, Difference equations, Transfer functions, Quantization, Computations, Algorithms, Two dimensional.
Identifiers: Recursive filters, Error analysis, Fast Fourier transform.

The concept of a two-dimensional recursive digital filter is introduced and block diagram representations are given. Expressions for error bounds and mean-square error for roundoff error accumulation are derived. Other sources of error are described. Simulation of the implementation of digital filters is discussed, and corresponding to this simulation, calculation of error is performed. Numerical examples are given. The derived analytic results are shown to be in good agreement with the simulation results. (Author)

AD-780 672/2GA PC$8.25/MF$1.45
Massachusetts Inst of Tech Cambridge Project Mac
A LANGUAGE IMPLEMENTATION SYSTEM.
Master's thesis,
Vernon E. Altman. May 74, 383p Rept no. MAC-TR-126
Contract N00014-70-A-0362-0006, ARPA Order-2095

Descriptors: *Programming languages, Grammars, Syntax, Semantics, Compilers, Mathematical logic, Computations, Algorithms, Theses.
Identifiers: MAC project, Artificial languages, Translator routines, Parsing, Design, Finite state machines.

The paper presents the design and implementation of a Language Implementation System (LIS) and investigates the use of that system in the development of artificial languages and their associated processors. The language Implementation System accepts the formal definition of the syntax and semantics of an artificial language, and synthesizes a processor for that language. The parsers (lexical and primary) of the processor are highly efficient Deterministic Push Down Automata (DPDAs) computed from the language's CLR(k) grammar. The CLR(k) (Comprehensive Left to Right, looking ahead k symbpls) grammars are defined in the paper, and are shown to include virtually all 'practical' artificial languages. Applications of the Language Implementation System are presented, and the system is shown to be applicable not only to 'traditional' artificial languages such as PL/I, Algol, and Lisp, but also to interactive management information/decision system languages. (Author)

AD-780 697/9GA PC$3.00/MF$1.45
Ogden Air Logistics Center Hill AFB Utah Service Engineering Div
COMPUTER SOFTWARE RELIABILITY. FACT OR MYTH.
Technical rept.,
Marlin Shelley. Nov 73, 24p* Rept no. TR-MMER/RM-73-125

Descriptors: *Computer programs, *Reliability, Errors, Costs.
Identifiers: *Computer program verification, Design.

For years computer hardware reliability has been a major concern of the computer industry and its customers. This same concern has not existed with computer software reliability, even though the annual costs for software of a computer system are many times more than the annual costs associated with hardware reliability. This study was undertaken in order to determine the nature of the software reliability problem, the techniques that are available or are being developed for improving software reliability, and the contract requirements for insuring improved reliability. (Author)

AD-780 732/4GA PC$3.25/MF$1.45
Ballistic Research Labs Aberdeen Proving Ground Md

DYNAMIC STORAGE ALLOCATION FOR THE BRLESC II COMPUTER.
Final rept.,
Morton A. Hirschberg. May 74, 29p Rept no. BRL-1718

Descriptors: *Computer programming, Memory devices, Allocations, Subroutines, FORTRAN.
Identifiers: *BRLESC 2 computer, *Computer storage management, SIMSCRIPT programming language.

The use of dynamic storage allocation for the BRLESC II computer is described, as well as the use of linked lists. This system was fashioned after the dynamic storage scheme used in SIMSCRIPT. Some of the SIMSCRIPT names being quite descriptive have been used here. (Author)

AD-780 804/1GA PC$4.00/MF$1.45
Massachusetts Computer Associates Inc Wakefield
DEVELOPMENT OF THEORETICAL FOUNDATIONS FOR DESCRIPTION AND ANALYSIS OF DISCRETE INFORMATION SYSTEMS.
Semi-annual technical rept. no. 1, 1 Dec 73-30 Jun 74.
6 Jun 74, 78p Rept no. CADD-7406-0611
Sponsored in part by Advanced Research Projects Agency, Arlington, Va.

Descriptors: *Information systems, *Artificial intelligence, Semantics, Syntax, Mathematical logic, Circuits, Graphics, Theorems.
Identifiers: *Petri nets, *Graph theory.

The first section considers a further development of ideas pertaining to the interpretation of Petri nets. The second section is an attempt to specify the mathematical foundation for the theory. The purpose of this section is purely to set forth the important structural ideas, not to show how these ideas relate to the semantic content they are designed to support. The third section reports on a new theorem due to Fred Commoner, about marked graphs, which has an important bearing on the development of Communication Mechanics.

AD-780 810/8GA PC$5.50/MF$1.45
Defense Systems Management School Fort Belvoir Va
PROCEEDINGS OF THE SYMPOSIUM ON INTERACTIVE COMPUTER GRAPHICS FOR PROJECT MANAGERS (1ST) AT FORT BELVOIR, VA. 10-11 OCTOBER 1973,
Charles H. Smith, III. Dec 73, 184p

Descriptors: *Interactive graphics, *Meetings, Management planning and control, Department of Defense, Pattern recognition, Curve fitting, Computer programming, Cathode ray tube screens.
Identifiers: Project management, Computer aided design.

The report is the collected papers of THE FIRST Interactive Computer Graphics Symposium for Project Management sponsored by the Defense Systems Management School, 10-11 October 1973 at Fort Belvoir. The purpose of the symposium was to bring together experts in the field of interactive computer graphics and Department of Defense project managers to exchange knowledge about the capabilities and problems which need solutions.

AD-780 841/3GA PC$3.75/MF$1.45
Softech Inc Waltham Mass
THE EFFECT OF SOFTWARE STRUCTURE ON SOFTWARE RELIABILITY, MODIFIABILITY, REUSABILITY, AND EFFICIENCY: A PRELIMINARY ANALYSIS,
John B. Goodenough, and Douglas T. Ross. Dec 73, 55p FA-R-2099
Contract DAAA25-72-C-0667

Descriptors: *Programming languages, *Compilers, *Reliability, Computer programming, Efficiency, Modification.
Identifiers: MAIDS(Multipurpose Automatic Inspection and Diagnostic Systems), Multipurpose automatic inspection and diagnostic systems.

The report is part of a study aimed at determining what programming language features, compiler capabilities, support tools, and program design disciplines are needed to produce reliable, easy to change, acceptably efficient, and reusable MAIDS (Multipurpose Automatic Inspection and Diagnostic Systems) test programs. The authors are attacking this objective by studying how properties of program structure affect the attainment of these test program objectives.

AD-780 843/9GA PC$3.75/MF$1.45
Army Combined Arms Combat Developments Activity Fort Leavenworth Kans
SYSTEM REFERENCE MANUAL FOR THE INDIVIDUAL UNIT ACTION (IUA) MODEL ON THE FORT LEAVENWORTH DATA PROCESSING INSTALLATION CDC 6500 COMPUTER SYSTEM.
Technical rept.,
Richard W. Johnson, James H. Kennington, and Raymond J. Posch. 1 Nov 73, 75p Rept no. CACDA-TR-1-73

Descriptors: *Data processing, *Computer programming, *Army operations, Tactical warfare, Terrain intelligence, Vulnerability, Mobility, Artillery, Compilers, Computer programs.
Identifiers: CDC 6500 computers, Fort Leavenworth.

The system reference manual for the Individual Unit Action (IUA) model was prepared by the Model Support Division of the Combat Operations Analysis Directorate, US Army Combined Arms Combat Developments Activity, Fort Leavenworth, Kansas. The manual describes the operation of the IUA model on the Fort Leavenworth Data Processing Installation's Control Data Corporation 6500 computer system and was prepared by the Model Support Division following its conversion of the model to that system. The manual presents a general description of the IUA system, provides resource requirements, and described IUA system initialization for six times phases and the IUA model execution. (Author)

AD-780 862/9GA PC$14.25/MF$1.45
Army Combined Arms Combat Developments Activity Fort Leavenworth Kans
PROCEDURE GUIDE FOR THE INDIVIDUAL UNIT ACTION (IUA) MODEL ON THE FORT LEAVENWORTH DATA PROCESSING INSTALLATION CDC 6500 COMPUTER SYSTEM.
Technical rept.,
Richard W. Johnson, James H. Kennington, and Raymond J. Posch. 1 Nov 73, 223p Rept no. CACDA-TR-2-73

Descriptors: *Data processing, *Computer programming, *Army operations, Instruction manuals, Defense systems, Terrain intelligence, Vulnerability, Mobility, Artillery, Data bases.
Identifiers: CDC 6500 computers, Fort Leavenworth.

The procedure guide for the Individual Unit Action (IUA) model was developed by the Model Support Division of the Combat Operations Analysis Directorate, US Army Combined Arms Combat Developments Activity, following the Division's conversion of the IUA model to run on the Fort Leavenworth Data Processing Installations's CDC 6500 computer system. The guide provides direction to users preparing to employ the IUA model in a specific application. The model's variable data decks and constant data bases are described, and sample input cards are provided. (Author)

AD-780 890/0GA PC$4.00/MF$1.45
Data Technology Inc Watertown Mass
PATTERN GRADING SYSTEM.
15 Jun 73, 20p
Contract DAAG17-72-C-0085

Descriptors: *Pattern recognition, *Computer programs, Digital systems, Plotting, Interpolation.

The Pattern Grading System developed under this contract consists of three major subsystems: Digitizing, Grading and Plotting. Each of these subsystems is a computer program with accompanying directions for use.

AD-780 901/5GA PC$3.25/MF$1.45
Massachusetts Inst of Tech Cambridge Project Mac
MATHEMATICAL FOUNDATIONS OF FLIP-FLOPS.
Technical memo.,
Vera Pless. Jun 74, 34p Rept no. MAC-TM-47
Contract N00014-70-A-0362-0006, ARPA Order-2095

Descriptors: *Logic circuits, Mathematical logic, Matrices(Mathematics), Permutations, Algorithms, Theorems.
Identifiers: *Flip flops, MAC project, Graph theory.

The main purpose of the paper is to lay a mathematical basis for the study of flip-flops. A J-K flip-flop is a device with 2 inputs (zero or one) and two outputs, one of which is always the complement of the other. A counter is a set of J-K flip-flops whose inputs are either constants (0 or 1) or outputs of other flip-flops in the counter. The paper only considers J-K flip-flops whose inputs are outputs of the other flip-flops. Whenever an n-counter is referred to, it shall mean such a counter with no constant inputs. The specification of the connections is called connection list.

AD-780 907/2GA PC$4.00/MF$1.45
Polytechnic Inst of New York Brooklyn Dept of Electrical Engineering and Electrophysics
MEANING OF EXHAUSTIVE SOFTWARE TESTING,
Martin L. Shooman. 2 Jan 74, 14p Rept nos. PINY-EE/EP-74-006, PINY-EER-105
Contracts N00014-67-A-0438-0013, NAS9-4065

Descriptors: *Computer programs, *Reliability, Errors, Test methods, Minicomputers.
Identifiers: Computer program verification.

The report defines the concept of an exhaustive software test in terms of a particular problem: The solution for the roots of quadratic equation with coefficients constrained to the range plus or minus 10 on a 12 bit minicomputer. The exhaustive test requires about 64 x 10 to the 9th power cases and is infeasible. The ensuing discussion focusses on how to choose a good non exhaustive test by an appropriate choice of test points in (1) Parameter space, (2) Solution space, (3) Pathspace. (Author)

AD-781 112/8GA PC$4.00/MF$1.45
Draper (Charles Stark) Lab Inc Cambridge Mass
INTELLIGENCE GRAPHICS.
Final rept.,
Peter D. Wolfe, Nathan E. Smith, and John E. Vella. Mar 74, 83p* Rept no. R-780 RADC-TR-74-52
Contract F30602-72-C-0208

Descriptors: *Interactive graphics, Information processing, Computer programming, Data processing terminals, Graphics, Computers, Data bases, Digital systems, Display systems, Television display systems, Interactions, Man machine systems, Editing, Computer applications, Data management, Color television.

Application-oriented software was developed for a programmable digital television display system, known as the Anagraph system. The Anagraph system is a standard, off-the-shelf product and includes a multi-terminal digital television display generator, a programmable display controller, and

a fixed-head disc for local data base storage. An IBM-compatible magnetic tape drive is also included in the system for which this software was developed. Software developed includes a Text Editor and a Graphic Editor. Both programs operate stand-alone on the programmable display controller. Data is transferred to and from the local data base by means of IBM standard-labelled magnetic tapes. The system, which is currently in operation at RADC, demonstrates the effectiveness of low-cost digital television techniques in support of intelligence data handling applications involving interactive text and graphic editing, local data-base access, and superposition of standard televeision data with computer-generated video. (Modified author abstract)

AD-781 140/9GA PC$3.25/MF$1.45
Rand Corp Santa Monica Calif
COMPUTER PERFORMANCE ANALYSIS. EVALUATION WITH MIXED ON-LINE/BATCH WORKLOADS.
Jo Ann Lockett. Feb 74, 33p Rept no. R-1275-PR
Contract F44620-73-C-0011

Descriptors: *On line systems, *Data processing, Performance(Engineering), Costs, Air Force equipment.
Identifiers: *Batch processing(Computers), Performance evaluation, IBM 360/65 computers.

The study verifies certain testing policies and procedures for evaluating mixed on-line/batch workload systems that had intuitively been thought to be worthwhile. The evaluation was conducted to determine the feasibility of removing an on-line system and one megabyte of core from Rand's IBM 360/65. The following policies were verified: (1) Complete test planning and pilot testing are extremely valuable; (2) metrics should be chosen prior to test design; (3) decision criteria should be chosen prior to data collection; (4) useful measurement of on-line systems is possible without expensive equipment. Testing procedures measured areas reflecting the level of service provided to users. (Author)

AD-781 171/4GA PC$10.50/MF$1.45
Analysis and Computer Systems Inc Burlington Mass
DEVELOPMENT OF COMPUTER-ORIENTED MATHEMATICAL METHODS FOR CLIMATOLOGICAL, ATMOSPHERIC AND CRYSTAL STUDIES.
Final rept. 1 Mar 71-28 Feb 74,
Arthur Abelowitz, Donald J. Armstrong, James F. Atkinson, Edward D. Conway, and Robert T. Delmonico. Mar 74, 147p AFCRL-TR-74-0170
Contract F19628-71-C-0124

Descriptors: *Computer applications, Meteorology, Photogrammetry, Acoustic waves, Surface waves, Crystals, Plasmas(Physics), Solar radiation, Computerized simulation, Computer programming, Panama Canal, Electron density, Ionospheric propagation, Data processing, Interactive graphics.
Identifiers: Acoustic surface waves, Solar radio emission, Microwave acoustics, Interdigital transducers, Soil water.

The report summarizes the work effort performed under the contract. During the three years covered by the report, over one hundred programs were completed ranging in complexity and size from conversion of programs from one language or computer system to another, to analysis and development of a large system of analytical programs operating in a real time enivronment. The mathematical and computer techniques developed under this contract supported AFCRL research projects in such areas as: Climatology, Meteorology, Microwave Acoustics, Ionospheric Physics, Plasma Physics and Radio Astronomy. A sampling of these projects are outlined in the report. (Modified author abstract)

AERE-R-7587 PC$4.25/MF$1.45
Ukaea Research Group, Harwell. Atomic Energy Research Establishment.
DESIGN OF HARDWARE SIMULATORS FOR COMPUTER INPUT/OUTPUT CHANNELS.
M. J. Purches. Feb 74, 21p

Descriptors: (*Computers, *Testing), (*Simulators, *Design).

For abstract, see NSA 30 01, number 02227.

AWRE-44-47-32 PC$4.50/MF$1.45
Ukaea Weapons Group, Aldermaston. Atomic Weapons Research Establishment.
FACILITIES PROVIDED BY THE ALDERMASTON MECHANICAL CATALOGUING AND ORDERING SYSTEM (AMCOS) USED IN THE AWRE LIBRARY.
J. F. MacSwiney. Feb 74, 48p

Descriptors: Information systems, Magnetic tapes.

For abstract, see NSA 30 01, number 02203.

BNL-18772 PC$4.00/MF$1.45
Brookhaven National Lab., Upton, N.Y. (Usa).
CRYSNET: A NETWORK OF INTELLIGENT REMOTE GRAPHICS TERMINALS.
H. J. Bernstein, L. C. Andrews, and F. C. Bernstein. 1973, 12p CONF-740512-6

Descriptors: (*Computer codes, *C codes), Crystallography, Economics, Graphic, Interactive display devices, Molecular structure.

For abstract, see NSA 30 01, number 02229.

COM-74-50541/3GA PC-GPO/MF$1.45-NTIS
National Bureau of Standards, Washington, D.C. Systems and Software Div.
RESEARCH CONSIDERATIONS IN COMPUTER NETWORKING TO EXPAND RESOURCE SHARING.
Final technical note,
Dennis W. Fife. Jun 74, 26p NBS-TN-801
Library of Congress Catalog Card no. 74-600089.
Paper copy available from GPO $0.60 as C13.46:801.

Descriptors: *Computer networks, *Time sharing, Resources, Management, Networks.

Computer networking technology is adequately developed now to support research and experimentation to expand computing resource sharing. Whether progress will be made depends upon organizational initiative among multiple institutions, to pool personnel and capital so as to effectively address the major issues in management approach, support and software design that limit the feasible interdependence of computing operations. The organizational requirements are partially revealed by examining progressive stages of resource sharing in organizational and operational terms rather than such technical aspects as load sharing or program sharing that have been introduced in the past. Five stages are identified, ranging from simply establishing multiple service access to the advanced stage where multiple institutions organize for joint development of new resources. (Modified author abstract)

COM-74-50545/4GA PC-GPO/MF$1.45-NTIS
National Bureau of Standards, Washington, D.C.
INTERPRETATION PROCEDURES FOR FEDERAL STANDARD COBOL.
Federal information processing standards(Final),
Robert E.Rountree, Jr. 30 Jun 74, 5p FIPS-PUB-29
Paper copy available from GPO $0.25 as C13.52:29.

Descriptors: *National Government, *Data processing, *COBOL, *Standards, Management information systems, Programming languages, Compilers, Interpretation.
Identifiers: *Federal information processing standards.

The FIPS PUB defines the procedures that will be followed in requesting interpretations of the Federal Standard COBOL and in providing responses to those requests. The provisions of this document apply to all Federal departments and agencies and to vendors of COBOL compilers in their dealings with the Federal Government.

COO-1469-238 PC$10.25/MF$1.45
Illinois Univ., Urbana (Usa). Dept. Of Computer Science.
QUARTERLY TECHNICAL PROGRESS REPORT, OCTOBER, NOVEMBER, DECEMBER 1973.
1973, 144p COO-2383-6, UIUCDCS-QPR-73-4

Descriptors: Computer codes, Computers, Electronic circuits, Electronic equipment, Research programs, Switching circuits.

For abstract, see NSA 30 01, number 02231.

COO-2383-3 PC$4.50/MF$1.45
Illinois Univ., Urbana (Usa). Dept. Of Computer Science.
ICGS SYSTEM: USERS MANUAL.
D. H. Mueller. Feb 74, 29p UIUCDCS-R-74-608
Contract AT(11-1)-2383

Descriptors: (*Computers, *Manuals), Illinois.

For abstract, see NSA 30 01, number 02232.

JINR-P10-7569 PC$4.00/MF$1.45
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Nuclear Problems.
HILBERT INFORMATION FEATURES AND THEIR APPLICATION FOR PATTERN RECOGNITION.
L. M. Soroko, and T. A. Strizh. 1974, 20p
In Russian.

Descriptors: Computers, Data, Data display devices, Diagrams, Hilbert space, Hilbert transformation, Information systems, Optical systems.

For abstract, see NSA 30 01, number 02233.

KAPL-P-4012 PC$5.50/MF$1.45
Knolls Atomic Power Lab., Schenectady, N.Y. (Usa).
GRAIL: A GRAPHICAL DEVICE-INDEPENDENT PICTURE DESCRIPTION SYSTEM.
J. A. Brooking. 8 Feb 74, 47p
Contract W-31-109-eng-52

Descriptors: (*Computer codes, *G codes), Diagrams, Display devices.

For abstract, see NSA 30 01, number 02234.

KFK-EXT-13-73-2 PC$5.00/MF$1.45
Kernforschungszentrum Karlsruhe (F.R. Germany). Inst. Fuer Datenverarbeitung in der Technik.
SOME THOUGHTS ABOUT THE LAY OUT OF USER-OPERATING SYSTEM INTERFACES AS A BASIS FOR SYSTEM SOFTWARE STANDARDIZATION.
J. Nehmer. Dec 73, 37p
In German.

Descriptors: (*Programming, *Standardized terminology), Computer codes.

For abstract, see NSA 30 01, number 02239.

KFK-EXT-8-73-2 PC$9.00/MF$1.45
Kernforschungszentrum Karlsruhe (F.R. Germany). Inst. Fuer Reaktorentwicklung.
GRAPHIC REFERENCE MANUAL.
H. Schnauder. Dec 73, 116p

In German.

Descriptors: Graphic, Manuals, Programming languages.

For abstract, see NSA 30 01, number 02236.

KFK-EXT-8-73-3 PC$4.75/MF$1.45
Kernforschungszentrum Karlsruhe (F.R. Germany). Inst. Fuer Reaktorentwicklung.
GRAPHIC: AN ICES SUBSYSTEM FOR GENERATING AND EDITING GRAPHICAL INFORMATION.
R. Schuster, and G. Enderle. Oct 73, 32p

Descriptors: Graphic, Programming languages, Two-dimensional calculations.

For abstract, see NSA 30 01, number 02237.

KFK-EXT-8-73-4 PC$5.00/MF$1.45
Kernforschungszentrum Karlsruhe (F.R. Germany). Inst. Fuer Reaktorentwicklung.
REGENT: FOURTH SEMIANNUAL PROGRESS REPORT, APRIL 1973--OCTOBER 1973.
E. G. Schlechtendahl. Jan 74, 36p
In German.

Descriptors: (*Planning, *Computers), Research programs.

For abstract, see NSA 30 01, number 02238.

KFK-PDV-12(Pt.2) PC$5.50/MF$1.45
Gesellschaft fuer Kernforschung M.B.H., Karlsruhe (F.R. Germany).
INTERACTIVE DIALOG SYSTEM. PART II.
E. Kazis. Oct 73, 49p
In German.

Descriptors: (*Computer codes, *I codes), Programming languages.

For abstract, see NSA 30 01, number 02240.

KFK-1926 PC$5.50/MF$1.45
Kernforschungszentrum Karlsruhe (F.R. Germany). Inst. Fuer Datenverarbeitung in der Technik.
PREPARATION OF A PROGRAM SYSTEM WITH SPECIAL CONSIDERATION OF PORTABILITY PROPERTIES.
H. Fichtel. Feb 74, 49p
In German.

Descriptors: Compatibility, Computers, Programming languages, Standards, Transport.

For abstract, see NSA 30 01, number 02235.

LA-UR-73-1287 PC$3.00/MF$1.45
Los Alamos Scientific Lab., N.Mex. (Usa).
SET THEORETIC APPROACH TO DATA TYPE EXTENSION.
J. B. Morris, and M. B. Wells. 1973, 15p CONF-740309-2

Descriptors: Algorithms, Group theory, Programming languages.

For abstract, see NSA 30 01, number 02243.

LA-5408-MS PC$4.00/MF$1.45
Los Alamos Scientific Lab., N.Mex. (Usa).
HIT: A MONTE CARLO TARGET-COVERAGE ROUTINE.
R. J. Beckman, and T. W. Dowler. Mar 74, 6p
Contract W-7405-eng-36

Descriptors: (*Computer codes, *H codes), Monte carlo method, Targets.

For abstract, see NSA 30 01, number 02396.

N74-21831/4GA PC$8.25/MF$1.45
Information Research Associates, Inc., San Antonio, Tex.
SPECIFICATIONS AND PROGRAMS FOR COMPUTER SOFTWARE VALIDATION.
Final Report.
J. C. Browne, R. Kleir, T. Davis, M. Henneman, and A. Haller. 20 Nov 73, 103p NASA-CR-120206
Contract NAS8-28084

Descriptors: *Checkout, *Computer systems programs, Algorithms, Fortran, Specifications.

For abstract, see STAR 1213

N74-21832/2GA PC$6.25/MF$1.45
Defence Research Establishment Valcartier (Quebec).
GRAPHIC VISUALIZATION CONSOLE WITH VECTOR GENERATOR FOR THE PDP-8 COMPUTER CONSOLE DE VISUALISATION GRAPHIQUE AVEC GENERATEUR DE VECTEURS POUR ORDINATEUR PDP-8.
P. E. Boutin, and J. Dorland. Oct 73, 62p DREV-TN-2039/73
In French; English Summary.

Descriptors: *Computer graphics, *Display devices, *Video data, Analog to digital converters, Computer storage devices, Graphs (Charts), Pdp 8 computer, Plotters.

For abstract, see STAR 1213

N74-21833/0GA PC$8.25/MF$1.45
Polytechnic Inst. of Brooklyn, N.Y. Dept. of Electrical Engineering and Electrophysics.
DIGITAL COMMUNICATIONS STUDY.
Final Report, 1 Jan. 1972 - 1 Jan. 1973.
R. R. Boorstyn. 1 Jan 73, 102p NASA-CR-138129, PIBEE/EP-73-006
Contract NGR-33-006-020

Descriptors: *Digital data, *Telecommunication, Digital filters, Parameterization, Queueing theory, Radar data, Signal processing, Turing machines.

For abstract, see STAR 1213

N74-21837/1GA PC$6.75/MF$1.45
Radio Corp. of America, Burlington, Mass. Aerospace Systems Div.
DATA BUS SYSTEM DEVELOPMENT PROGRAM.
Technical Final Report.
J. S. J. Harrison. Nov 73, 74p NASA-CR-134241, CR-72-588-030
Contract NAS9-12110

Descriptors: *Bus conductors, *Computer components, *Computer systems design, *Remote consoles, Control units (Computers), Data acquisition, Error analysis, Fabrication.

For abstract, see STAR 1213

N74-21838/9GA PC$11.75/MF$1.45
Intermetrics, Inc., Cambridge, Mass.
THE GOAL-TO-HAL/S TRANSLATOR SPECIFICATION.
Final Report.
S. F. Stanten, and J. H. Flanders. 15 Dec 73, 172p NASA-CR-138159
Contract NAS10-8385

Descriptors: *Airborne/spaceborne computers, *Programming languages, *Space shuttles, Checkout, Flow charts, Ground support equipment, Translators.

For abstract, see STAR 1213

N74-21840/5GA PC$4.50/MF$1.45
Defence Research Establishment Suffield, Ralston (Alberta).
AN INTERFACE BETWEEN A DIGITAL CONCENTRATION READOUT DEVICE AND A TELETYPE UNIT.
L. A. Gau, and J. F. Ross. Nov 73, 26p MEMO-7/73

Descriptors: *Data processing equipment, *Interfaces, *Readout, *Teletypewriters, Chemical analysis, Computer graphics, Digital techniques, Display devices.

For abstract, see STAR 1213

PB-232 771/6GA PC$6.50/MF$1.45
Illinois Univ., Urbana. Dept. of Computer Science.
MACHINE PARAMETER DEDUCTION BY PROGRAM ANALYSIS.
Master's thesis,
Kuo Yen Wen. Aug 74, 66p UIUCDCS-R-74-636
NSF-OCA-GJ-36936-000002
Grant NSF-GJ-36936

Descriptors: *Parallel processors, *Compilers, *Linear algebraic equations, *Computation, Eigenvalues, Matrices(Mathematics), Mathematical logic, FORTRAN, Theses.

In the paper, a generalized procedure is established to analyze FORTRAN programs in order to deduce some parameters of machine organization. The maximum possible average speedup and the corresponding efficiency for the set of FORTRAN programs are determined through the use of the FORTRAN Analyzer. Then a method of using operation type statistics to infer parts of machine structure is shown. In the paper, EISPACK programs are used. However, the same procedure can be applied to any set of meaningful FORTRAN programs.

PB-232 910/0GA PC$3.25/MF$1.45
Massachusetts Inst. of Tech., Cambridge. Computation Structures Group.
EXTENDED STATE-MACHINE ALLOCATABLE NETS (ESMA), AN EXTENSION OF FREE CHOICE PETRI NET RESULTS.
Interim rept.,
Michael Hack. Jun 74, 41p CSG-Memo-78-1 NSF-OCA-GJ34671
Grant NSF GJ-34671
Report on Project MAC.

Descriptors: *Learning machines, *Network flows, Graph theory, Mathematical logic, Switching theory, Automata theory, Theorems.
Identifiers: MAC project, *Petri nets, Free choice nets, Schema theory, Finite state machines.

The paper presents a few notes about a class of Petri Nets that are very similar to Free Choice Nets and strictly include all Well-Formed Free Choice Nets (WFFC Nets).

PB-233 212/0GA PC$6.75/MF$1.45
Maryland Univ., College Park. Computer Science Center.
DESIGN OF A VERTICALLY-MICROPROGRAMMED MEMORY PROCESSOR.
Technical rept.,
George G. Kiruthi. Jun 74, 72p TR-306
Grant NSF-GJ-33013

Descriptors: *Computer storage devices, *Operating systems(Computers), *Compilers, Computer programming, Programming manuals, Algorithms.
Identifiers: *Microprogramming.

The report describes the design of a special control processor, called memory processor. The memory processor is a hardware main-memory manager as a part of a hardware system. The major functions of the memory processor is to keep track of which parts of the main memory are in use and which parts are free. It can allocate, deallocate and compact the main memory. For achieving flexibility,

the memory processor is chosen to be microprogram-controlled. For ease of microprogramming and re-microprogramming, a vertical micro-instruction format is used. Details of the design are given. The details include the flow chart, the sequence charts, and the microprogram. The CDL description of the complete design is also included.

PB-233 400/1GA PC$6.75/MF$1.45
Columbia Univ., New York. Dept. of Graphics.
SPECIAL CONFERENCE ON COMPUTER GRAPHICS AS RELATED TO ENGINEERING DESIGN. VOLUME 1. STATE-OF-THE-ART AND RESEARCH PRIORITIES.
Final rept.,
Sami Al-Banna, and Larry J. Feeser. Jul 73, 73p
NSF-GK37159-1, NSF-GK37160-1
Grant NSF-GK-37159, NSF-GK-37160
Prepared in cooperation with Colorado Univ., Boulder. Dept. of Civil and Environmental Engineering. See also Volume 2, PB-233 401.

Descriptors: *Computer programming, *Graphic methods, *Meetings, Engineering, Design criteria, Man machine systems.
Identifiers: *Interactive computer graphics, *Computer aided design.

The workshop was held to evaluate the impact of over a decade of activities in the field of Interactive Computer Graphics on automating engineering and architectural design. The aim of the workshop was to outline research topics in the area of Interactive Computer Graphics as it relates to the automation of design. This report includes a review of the state-of-the-art of interactive computer graphics and design. A summary of existing hardware technology and current software concepts are included. Problems of man-machine interface are outlined. A broad assortment of existing applications of computer graphics in design are depicted also. (Modified author abstract)

PB-233 401/9GA PC$22.50/MF$1.45
Columbia Univ., New York. Dept. of Graphics.
SPECIAL CONFERENCE ON COMPUTER GRAPHICS AS RELATED TO ENGINEERING DESIGN. VOLUME 2. PAPERS AND TRANSCRIPTS.
Final rept.,
Sami Al-Banna, and Larry J. Feeser. Jul 73, 388p
NSF-GK37159-2, NSF-GK37160-2
Grant NSF-GK-37159, NSF-GK-37160
Prepared in cooperation with Colorado Univ., Boulder. Dept. of Civil Engineering. See also Volume 1, PB-233 400.

Descriptors: *Computer programming, *Graphic methods, *Meetings, Engineering, Architecture, Design criteria, Man machine systems, Computer systems hardware.
Identifiers: *Interactive computer graphics, *Computer aided design.

The discussions and results of the Special Conference on Computer Graphics as Related to Engineering Design held in Boulder, Colorado on July 12 and 13, 1973 are presented in a final report of two volumes. The report contains the portion of the report consisting of the papers prepared for and distributed at the conference and the verbatim transcript of the conference discussions and deliberations.

RT/FIMA-(73)2 PC$4.50/MF$1.45
Comitato Nazionale Per l'Energia Nucleare, Rome (Italy).
GRAFD3: A SUBPROGRAM FOR THE THREE-DIMENSIONAL REPRESENTATION OF A SURFACE Z(X,Y).
P. Mengoli, and A. Taroni. 27 Nov 73, 30p
In Italian.

Descriptors: (*Computer codes, *G codes), (*Diagrams, *Three-dimensional calculations), Functions.

For abstract, see NSA 30 01, number 02245.

SGAE-2219 PC$4.25/MF$1.45
Oesterreichische Studiengesellschaft fuer Atomenergie G.M.B.H., Seibersdorf. Elektronikinstitut.
CAMAC: ANALOG MODULS.
W. Marschik, and H. Schwabach. Dec 73, 24p
In German.

Descriptors: (*Camac system, Multiplexers), (*Multiplexers, *Specifications), Analog-to-digital converters.

For abstract, see NSA 30 01, number 02246.

SGAE-2225 PC$4.00/MF$1.45
Oesterreichische Studiengesellschaft fuer Atomenergie G.M.B.H., Seibersdorf. Elektronikinstitut.
SPHERE SIZE METER IN THE CAMAC KDM-1.
F. Buschbeck, and H. Telefont. Jan 74, 18p
In German.

Descriptors: (*Spheres, *Measuring methods), Camac system, Computers.

For abstract, see NSA 30 01, number 02247.

SGAE-2227 PC$4.00/MF$1.45
Oesterreichische Studiengesellschaft fuer Atomenergie G.M.B.H., Seibersdorf. Forschungszentrum.
FORTRAN SUBROUTINE PAT. DECODING AND CONVERSION OF PAPER TAPES IN ANY CODE.
F. Horvath, and W. Krotz. Jan 74, 14p
In German.

Descriptors: (*Computer codes, *P codes), Fortran, Punched tapes.

For abstract, see NSA 30 01, number 02248.

SLA-74-5186 PC$4.25/MF$1.45
Sandia Labs., Albuquerque, N.Mex. (Usa).
REAL TIME DIGITAL CONTROL OF REMOTE TRACKING INSTRUMENTS.
D. F. Anderson, and L. W. Maschoff. 22p

Descriptors: (*Remote viewing equipment, *Real time systems), Computers, Control systems, Equipment, Radar, Radiowave radiation, Remote handling.

For abstract, see NSA 30 01, number 02253.

SLA-74-95 PC$8.50/MF$1.45
Sandia Labs., Albuquerque, N.Mex. (Usa).
BRIEF INSTRUCTIONS FOR USING THE SANDIA NUMERICAL MATHEMATICAL SUBROUTINE LIBRARY ON THE CDC 6600.
C. B. Bailey, and R. E. Jones. Apr 74, 110p
Contract AT(29-1)-789

Descriptors: (*Computer codes, *M codes), Cdc computers, Information, Information systems, Mathematics, Numerical solution.

For abstract, see NSA 30 01, number 02249.

SLL-73-215 PC$4.50/MF$1.45
Sandia Labs., Livermore, Calif. (Usa).
CDC 6600 DATA MANAGER. A MULTI-DIMENSIONAL TABULATED FUNCTION MANAGER AND LINEAR INTERPOLATOR.
J. Mansfield. Apr 74, 30p
Contract AT(29-1)-789

Descriptors: Algorithms, Cdc computers, Data processing, Functions, Numerical solution, Programming.

For abstract, see NSA 30 01, number 02254.

SLL-73-305 PC$4.50/MF$1.45
Sandia Labs., Albuquerque, N.Mex. (Usa).
TJMAR1: FORTRAN SUBROUTINE FOR NON-LINEAR LEAST SQUARES PARAMETER ESTIMATION.
T. H. Jefferson. Mar 74, 29p
Contract AT(29-1)-789

Descriptors: (*Computer codes, *T codes), (*Least square fit, *Programming), Algebra, Cdc computers, Data, Fortran.

For abstract, see NSA 30 01, number 02255.

SLL-74-5218 PC$4.00/MF$1.45
Sandia Labs., Livermore, Calif. (Usa).
GRAPHICS APPLICATIONS FOR FINITE ELEMENT CODE PROCESSING.
V. K. Gabrielson. Apr 74, 20p CONF-740512-4

Descriptors: Algorithms, Cdc computers, Electron tubes, Fortran, Graphic, Image storage tubes, Interactive display devices, Interfaces, Memory devices.

For abstract, see NSA 30 01, number 02256.

UCID-16462 PC$12.50/MF$1.45
California Univ., Livermore (Usa). Lawrence Livermore Lab.
LECTURE NOTES FOR A COURSE IN THE FUNDAMENTALS OF DIGITAL SYSTEMS.
D. K. Fisher. 1974, 189p
Contract W-7405-eng-48

Descriptors: (*Programming, *Lectures), (*Computers, Lectures), Semiconductor switches, Switching circuits.

For abstract, see NSA 30 01, number 02258.

UCID-30090 PC$4.50/MF$1.45
California Univ., Livermore (Usa). Lawrence Livermore Lab.
METRIC: A UNIT-CONVERSION PROGRAM FOR THE CDC 7600. PART I. USING THE PROGRAM.
D. Y. F. Lai. 29 Mar 74, 26p
Contract W-7405-eng-48

Descriptors: (*Computer codes, *M codes), Cdc computers, Conversion, Lawrence livermore laboratory, Measuring methods, Standardized terminology.

For abstract, see NSA 30 01, number 02260.

UCRL-75145 PC$4.00/MF$1.45
California Univ., Livermore (Usa). Lawrence Livermore Lab.
EDP EDUCATION: AN ACUTE CRISIS.
G. K. Kapur. 12 Oct 73, 14p CONF-740507-1

Descriptors: (*Programming, *Education), Computers, Data processing.

For abstract, see NSA 30 01, number 02425.

UCRL-75578 PC$4.00/MF$1.45
California Univ., Livermore (Usa). Lawrence Livermore Lab.
SET OF DEVICE-INDEPENDENT FIRST LEVEL GRAPHICS ROUTINES.
N. A. Storch. 26 Mar 74, 10p CONF-740512-3

Descriptors: (*Computer codes, *T codes), Fortran, Graphic.

For abstract, see NSA 30 01, number 02261.

9C. Electrical and Electronic Engineering

AD-781 139/1GA PC$7.50/MF$1.45
Texas Univ Austin Electronics Research Center

TEXAS BIANNUAL OF ELECTRONICS RESEARCH NUMBER 18.
Interim rept. 1 Apr-30 Sep 73,
Arwin A. Dougal, J. K. Aggarwal, O. M. Friedrich, Jr., D. G. Lainiotis, and E. J. Powers. 15 Nov 73, 347p AFOSR-TR-74-0963
Contract F44620-71-C-0091
See also Number 17, AD-763 729.

Descriptors: *Electronics, Solid state electronics, Information systems, Plasmas(Physics), Quantum electronics, Acoustics, Biomedicine, Geomagnetism, Pulsation, Control theory, Bioengineering.

Research topics in progress, recent findings, and future plans in the areas of biomedical electronics; information systems; plasma and quantum electronics; solid state electronics; and acoustics and radio sciences are presented. This eighteenth biannual is highlighted by new results obtained in several of these areas. (Author)

9D. Information Theory

AD-780 585/6GA PC$4.75/MF$1.45
North Carolina Univ Chapel Hill Dept of Statistics
BANDLIMITED PROCESSES AND CERTAIN NONLINEAR TRANSFORMATIONS.
Interim rept.,
Elias Masry, and Stamatis Cambanis. Feb 74, 32p Rept no. Mimeo Ser-912 AFOSR-TR-74-0895
Grant AF-AFOSR-2386-72, Contract N00014-69-A-0200-6037

Descriptors: *Signal processing, *Stochastic processes, Linear systems, Measure theory, Hilbert space, Fourier transformation, Theorems.
Identifiers: *Bandlimited functions, Zakai theorem, Uniqueness theorems, Gaussian processes.

The paper considers the problem of the uniqueness and invertibility of a certain class of nonlinear transformations acting on stochastic signals. The transformation consists of an instantaneous nonlinearity followed by a bandlimiting linear system and the input is a bandlimited process in the sense of Zakai. For Gaussian, possibly noisy, inputs and a large class of nonlinear systems it is shown that there is one to one correspondence between the input and the output. As an application some new results on the curve crossings of bandlimited Gaussian processes are derived. Furthermore the sample functions of the input process are reconstructed from, possibly noisy, observations of the output process for a specific class of nonlinearities followed by a variety of linear systems. (Author)

AD-780 990/8GA PC$3.25/MF$1.45
California Univ Los Angeles Dept of System Sciences
BALANCED CONVOLUTIONAL SOURCE AND CHANNEL CODING.
Final rept.,
Andrew J. Viterbi. 31 May 74, 29p AROD-9686.3-EL
Grant DA-ARO-D-31-124-71-G89

Descriptors: *Coding, *Data transmission systems, Decoding, Signal to noise ratio, Bandwidth, Probability density functions.
Identifiers: *Convolutional coding, Rate distortion functions, Maximum likelihood estimation.

A convolutional source coding technique, which is the dual of the well-known maximum likelihood convolutional channel decoding algorithm, has been analyzed and its performance bounded in terms of the rate-distortion function. The source encoder is equivalent to a channel (trellis) decoder, while the source decoder is equivalent to a channel (shift register) encoder. Thus the complexity of the source encoder balances the simplicity of the channel encoder, while the simplicity of the source decoder balances the complexity of the channel decoder. Consequently, the transmitting and receiving terminals are almost symmetrical. (Modified author abstract)

N74-21797/7GA PC$4.00/MF$1.45
Kanner (Leo) Associates, Redwood City, Calif.
RESTORATION OF THE SHAPE OF ANALOG SIGNALS BY DISCRETE READINGS.
V. P. Yevdokimov, and L. I. Kolesnikov. Apr 74, 16p NASA-TT-F-15546, PR-135
Contract NASW-2481
Tran-Transl. Into English of "Vosstanovleniye Formy Analogovykh Signalov Po Diskretnym Otschetam", Acad. Of Sci. Of the USSR, Inst. Of Space Res., Moscow, Report PR-135, 1973 19 p.

Descriptors: *Analog data, *Correlation, *Discrete functions, *Filters, *Signal analysis, Data transmission, Mathematical models, Restoration.

For abstract, see STAR 1213

9E. Subsystems

AD-780 535/1GA PC$5.75/MF$1.45
Syracuse Univ N Y
A SCATTERING VARIABLE APPROACH TO NONLINEAR SYSTEMS.
Technical rept. 1 Jul 72-1 Jul 73,
Gerald Harvey Naditch. May 74, 214p RADC-TR-74-106
Contract F30602-72-C-0360

Descriptors: *Circuits, *Signal processing, *Nonlinear systems, Volterra equations, Waveform generators, Transmission lines, Tunnel diodes, Transistor amplifiers, Matrices(Mathematics), Mathematical models.
Identifiers: Network analysis theory, Time invariant systems.

A new mathematical model is developed which extends Volterra series analysis of nonlinear systems with memory to high-frequency systems, including those containing linear, passive, distributed component devices. Scattering variables, described by a linear transformation of voltage and current in lumped circuits, and by incident and reflected waves in distributed circuits, are used as fundamental quantities in Volterra functional series. A set of nonlinear Volterra scattering kernels results describing the output signal behavior of the system. The frequency-domain Volterra kernels, which can be interpreted as generalized response functions, are analogous to linear scattering parameters. They can be used to describe power transfer and distortion measures of nonlinear multi-ports. In particular, when the input signal amplitudes are small, the nth order harmonic component in the output signal can be closely approximated by evaluating a single kernel. (Modified author abstract)

AD-780 548/4GA PC$3.25/MF$1.45
Aerospace Corp El Segundo Calif Lab Operations
MEASUREMENT OF THE NONLINEAR IMPEDANCE OF A SATELLITE-BORNE, ELECTRIC-DIPOLE ANTENNA.
Interim rept.,
Harry C. Koons, and Donald A. McPherson. 31 May 74, 45p Rept no. TR-0074(9260-09)-8
SAMSO-TR-74-122
Contract F04701-73-C-0074

Descriptors: *Satellite antennas, Dipole antennas, Electrical impedance, Antennas, Nonlinear systems, Plasmas(Physics), Very low frequency, Extremely low frequency.
Identifiers: OV1-21S satellite.

The nonlinear impedance of a satellite-borne, electric-dipole antenna was measured at ELF/VLF at drive voltages between 10 mV and 100 V peak-to-peak. The magnitude of the impedance is in general agreement with the predictions of theoretical models of plasma-clad antennas. At low voltages the phase angle of the impedance is in agreement with linear sheath models, i.e., at low densities the current leads the voltage and as the density increases the phase angle approaches zero. However, at high drive voltages the current lags the voltage. Above 10 V p-p the phase angle often exceeds +90 deg. (Author)

AD-780 500/9GA PC$3.25/MF$1.45
Hamilton Standard Windsor Locks Conn
INFRARED TESTING OF MULTI-LAYER BOARDS.
Final rept. 26 Sep 73-12 Jan 74,
Ralph W. Woodgate. Apr 74, 44p RADC-TR-74-88
Contract F30602-74-C-0024

Descriptors: *Nondestructive testing, Infrared lasers, Thermal analysis, Test methods, Heat transmission, Infrared detectors, Holes(Openings), Sandwich construction, Emissivity, Coatings, Reliability(Electronics).
Identifiers: *Printed circuit boards.

Calculations show that quickly heating the pad surface of a plated through hole in a multi-layer printed circuit board, and plotting the time/temperature curve as the heat flows into the hole structure, will indicate the quality of the plated through hole. Limitations exist as to the degree of disconnect and the number of layers that can be tested. Experiment suggests the validity of the calculations, but shows up problems in the practical usage of the system, in particular the selection and production of effective emissivity standardization coatings. (Author)

AD-780 564/1GA PC$3.00/MF$1.45
Admiralty Surface Weapons Establishment Portsmouth (England)
RADOME MOUNTED POLARISING GRIDS.
Technical rept.,
A. C. Large. Dec 73, 11p Rept no. ASWE-TR-73-32 DRIC-BR-39869

Descriptors: *Grids, *Microwave antennas, Polarization, Antenna radiation patterns, Microwaves, Microwave equipment, Radomes, Radiation, Transmission loss, Great Britain.

Polarizing grids supported on the surfaces of an 'A' sandwich radome structure are described. Grids consisting of two and four wire layers have been tested and shown capable of changing the polarized direction of the radiated field from an X band antenna by 45 degrees and 90 degrees respectively. A radome mounted grid capable of providing a continuous adjustment of polarization direction over a limited angular range is also described. (Author)

AD-780 702/7GA PC$3.25/MF$1.45
Raytheon Co Waltham Mass Special Microwave Devices Operation
MILLIMETER WAVE AVALANCHE TRANSIT TIME DIODE AMPLIFIER.
Quarterly repts. 1/2, 1 Jul-31 Dec 72,
Wen C. Chen, and Leslie H. Sims. May 74, 40p Rept nos. SM-342, Micro-State-1072-634 ECOM-0228-1-72, ECOM-0228-2-72
Contract DAAB07-72-C-0228

Descriptors: *Microwave amplifiers, *Millimeter waves, Avalanche diodes, IMPATT diodes, Gallium arsenides, Fabrication, K band, Heat sinks, Semiconductor devices.
Identifiers: Design.

Preliminary flip-chip diodes were fabricated, and several wafers of GaAs epitaxial material were chosen for further diode development work. In addition to the diode effort, initial plans were made on the design of the avalanche diode amplifier. The approach chosen was a 3 stage ADA which assumed that the required circulator design and fabrication would be done in house in order to meet the overall amplifier requirements. During the second quarter, all of the effort was concentrated on the evaluation of GaAs epi material for its IMPATT diode potential. 50% of the initial 28 crystal wafers were found to be suitable for millimeter wave avalanche transit time diode fabrication. In order to reduce the parasitics and to in-

crease the power handling capability of the diode the major portion of the effort concentrated on the fabrication of plated heat sink (PHS) type millimeter wave IMPATT diodes. Nine wafers were recommended for PHS diode fabrication. (Modified author abstract)

AD-780 912/2GA PC$4.75/MF$1.45
Martin Marietta Aerospace Orlando Fla
FAILURE MECHANISMS IN IRRADIATED PLASTIC INTEGRATED CIRCUITS.
Final rept. 1 Jul-31 Dec 73,
Sheldon A. Taylor. Apr 74, 140p Rept no. OR-12957 ECOM-0313-F-73
Contract DAAB07-73-C-0313

Descriptors: *Integrated circuits, Radiation effects, Encapsulation, Plastics, Failure(Electronics), Reliability(Electronics).

The program was devised to evaluate the performance of plastic integrated circuits in various types of radiation environments. Two different test parts were employed. These parts were selected to be representative of broad semiconductor processing technologies. The bipolar process technology was represented by 741 operational amplifier. The complementary metal-oxide-silicon (CMOS) process was represented by the 4028 binary-to-decimal decoder. (Modified author abstract)

AD-780 935/3GA PC$3.75/MF$1.45
Lehigh Univ Bethlehem Pa
INVESTIGATION OF THE PHYSICAL ORIGINS OF NOISE IN AVALANCHE AND GUNN OSCILLATORS AND NOISE REDUCTION TECHNIQUES.
Final rept. 15 Dec 70-15 Mar 74,
Daniel Leenov, and John G. Ondria. 8 May 74, 54p* AROD-9283.4-EL
Grant DA-ARO-D-31-124-71-G41

Descriptors: *Microwave oscillators, Avalanche diodes, Gunn diodes, IMPATT diodes, Noise(Electrical and electromagnetic), Noise reduction, Electronic equipment, Electrons, Transfer.
Identifiers: Transferred electron devices.

The noise generated by Gunn diode microwave oscillators was studied to determine the physical causes of noise, the relation between low frequency and microwave noise, and to develop an equivalent circuit for the diode. The use of a cavity to reduce FM noise was investigated. Methods for optimizing the performance of IMPATT diode oscillators, including noise performance, were studied. Portions of this document are not fully legible.

AD-781 014/6GA Reprint
Air Force Cambridge Research Labs I. G Hanscom Field Mass
FREQUENCY SYNTHESIZER USING ACOUSTIC SURFACE-WAVE FILTERS,
A. J. Budreau, P. H. Carr, and K. R. Laker. 1974, 5p Rept no. AFCRL-TR-74-0230
Availability: Pub. in Microwave Jnl., Mar 74 (Technical Feature, SAW Ser. no. 2).

Descriptors: *Frequency synthesizers, Filters, Acoustic equipment, Surface waves, Acoustic waves, Microwave equipment.
Identifiers: Acoustic surface waves.

Acoustic surface-wave technology was used to implement a novel, compact, microwave frequency synthesizer. The technique requires the use of one stable clock to control the frequencies of a comb generator. The comb frequencies are separated into 21 continuously available output frequencies by a contiguous acoustic surface-wave filter bank contact-printed on a piezoelectric slab 2 by 0.9 cm. The design and fabrication of the acoustic surface-wave filters is discussed together with the packaging of the final device. (Author)

AD-781 108/6GA PC$4.00/MF$1.45
General Electric Co Syracuse N Y Heavy Military Electronic Systems
LOW-VOLUME HIGH-POWER RADIATING TRANSMITTER.
Final rept. 17 Jan 73-17 Jan 74,
G. F. Farrell, Jr., S. K. Altes, and A. A. Schill. Apr 74, 92p RADC-TR-74-87
Contract F30602-73-C-0092

Descriptors: *Antenna arrays, Antenna radiation patterns, Scanning, Antennas, Electrical impedance, Gain, Arrays, Beam steering.

Discussed in detail are: Element impedance values in a densely packed array, performance of a 512-element array, and a high-power plug-in module. Questions concerning the effect of E- and H-plane scanning on array performance are answered. The results of array performance with respect to radiation patterns, gain and beam steering are also presented. (Author)

AD-781 114/4GA PC$4.00/MF$1.45
Polytechnic Inst of New York Brooklyn
GENERATION OF ULTRA-HIGH POWER ELECTRICAL PULSES.
Final rept. 1 Dec 72-30 Nov 73,
L. Birenbaum, and E. Levi. May 74, 86p RADC-TR-74-119
Contract F30602-73-C-0053

Descriptors: *Pulse generators, *Radiofrequency generators, High power, Video signals, Microwave equipment, Generators, Radiofrequency power, Reviews, State of the art, Energy conversion, Superconductivity, Plasmas(Physics).

The report is a comprehensive assessment of the state-of-the-art of various energy conversion techniques involving high power electrical pulse generation. The subjects treated include rotating machines, explosive devices, superconductivity, switching, and plasma techniques, including the supercritical temperature and pressure regions. (Author)

AD-781 149/0GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
CONSTRUCTION ALGORITHMS OF THE CONTROL CIRCUITS OF CONVERTER UNITS USING PULSE-POSITION MULTI-STABLE ELEMENTS,
V. P. Grafov, G. N. Elizarenko, V. D. Kolomiets, and A. S. Tolstoukhov. 17 Jun 74, 10p Rept no. FTD-HT-23-1024-74
Edited trans. of mono. Mnogoustoichivye Elementy i ikh Primenenie. Sbornik Statei, n.p., 1971 p308-314, by Frank C. Vaughn.

Descriptors: *Converters, Control, Circuits, Algorithms, Semiconductor devices, Translations, USSR.

AD-781 163/1GA PC$4.00/MF$1.45
Army Foreign Science and Technology Center Charlottesville Va
NARROW BAND SIGNAL SPECTRUM SERVOMECHANISM,
I. I. Gorin. 3 Dec 73, 5p Rept no. FSTC-HT-23-697-73
Trans. of Patent (USSR) 238 680.

Descriptors: *Servomechanisms, Signals, Tracking, Narrowband, Patents, Translations, USSR.

A simplified servomechanism for a narrow-band signal spectrum, such as a Doppler Spectrum, is discussed. The servomechanism consists essentially of a single-band modulator, synchronous, self-tuning filter with two charging capacitors, an inverter, integrator, level comparator and generator, controlled by a lock-on signal. It operates basically by supplying a voltage to the generator, which drops to zero as the output frequency of the modulator approaches the mean frequency of the filter, at which time the level comparator generates a lock-on signal, changing the computer or other input device to the useful signal tracking mode.

BDX-613-1044 PC$4.00/MF$1.45
Bendix Corp., Kansas City, Mo. (Usa).
NONDESTRUCTIVE METHODS FOR THE ACCEPTANCE OF PLATING THICKNESS ON PRINTED CIRCUIT BOARDS.
A. B. Abel. 20p
Contract AT(29-1)-613

Descriptors: (*Printed circuits, *Plating), Copper, Industry, Nondestructive testing, Radiometric gages, Thickness.

For abstract, see NSA 30 01, number 02313.

BDX-613-1066 PC$4.00/MF$1.45
Bendix Corp., Kansas City, Mo. (Usa).
TEN-BIT, SAMPLE AND HOLD OR PEAK HOLD CONVERTER.
S. E. Grant. Jan 74, 5p
Contract AT(29-1)-613

Descriptors: Amplitudes, Analog-to-digital converters, Comparative evaluations, Comparator circuits, Diagrams, Electronic circuits, Pulse converters.

For abstract, see NSA 30 01, number 02385.

JPRS-62192 PC$3.25/MF$1.45
Joint Publications Research Service, Arlington, Va.
MICROCIRCUITS AND FIELD TRANSISTORS,
V. N. Bryunin, F. S. Tsybizov, V. I. Ovcharenko, N. I. Voronova, and N. P. Stepanov. 7 Jun 74, 33p Trans. of Elektronnaya Tekhnika (USSR) n5 p40-47, 79-85, 92-97, 109-111 1972.

Descriptors: *Microelectronics, *Field effect transistors, Integrated circuits, Failure, Reliability(Electronics), Translations, USSR.
Identifiers: *Hybrid microcircuits.

Contents:
- Analysis of failures of hybrid integrated microcircuits;
- The quality of thermocompression connections and means of improving the dependability of microcircuits;
- Method of closing and breaking testing of field transistors with p-n junctions;
- Compatibility of materials and dependability of hybrid microcircuits;
- Reading list on quality control problems.

N74-21796/9GA PC$4.00/MF$1.45
Scientific Translation Service, Santa Barbara, Calif.
INFLUENCE OF STATICALLY UNEVEN UNDERLYING SURFACE UPON RADIATION CHARACTERISTICS OF PHASED ANTENNA ARRAY.
A. I.. Ayzenberg, and B. V. Shatokhin. Apr 74, 11p NASA-TT-F-14787
Tran-Transl. Into English from Radiotekhn. (Moscow), V. 28, No. 5, 1973 p 49-54. Subm-Sponsored by NASA.

Descriptors: *Antenna radiation patterns, *Phased arrays, *Surface roughness effects, Directivity, Polarization characteristics, Signal distortion.

For abstract, see STAR 1213

N74-21857/9GA PC$4.75/MF$1.45
Calspan Corp., Buffalo, N.Y. Electronics Research Dept.
PLANAR ELECTROLUMINESCENT PANEL TECHNIQUES.
Final Report.

C. Kerr, and R. E. Kell. Feb 73, 35p NASA-CR-139002, IM-2280-E-1
Contract NAS5-10192

Descriptors: *Display devices, *Electroluminescence, *Planar structures, Computer storage devices, Decoders, Electro-optics, Feasibility analysis.

For abstract, see STAR 1213

N74-21860/3GA PC$4.00/MF$1.45
Helsinki Univ. of Technology, Otaniemi (Finland). Radio Lab.
EUROPEAN MICROWAVE CONFERENCE, 1973.
1973, 18p REPT-S-59

Descriptors: *Conferences, *Microwave amplifiers, *Microwave coupling, *Microwave radiometers, *Strip transmission lines, Amplifier design, Dielectric properties, Microwave transmission, Remote sensors, Sea ice.

For abstract, see STAR 1213

N74-21891/8GA PC$5.00/MF$1.45
National Aeronautics and Space Administration, Washington, D.C.
SWITCHING THEORY OF LINEAR MICROWAVE NETWORKS.
H. Brand. Jan 73, 39p NASA-TT-F-14736
Tran-Transl. Into English from Schaltungslehre Linearer Mikrowellennetze, 1970 p 136-143, 205-211, 226-231, 285-289.

Descriptors: *Linear systems, *Microwave frequencies, *Network synthesis, *Switching theory, Coordinates, Sine waves, Tensor analysis, Variable geometry structures.

For abstract, see STAR 1213

N74-21892/6GA PC$7.00/MF$1.45
Helsinki Univ. of Technology, Otaniemi (Finland). Radio Lab.
APLAC2: A FLEXIBLE DC AND TIME DOMAIN CIRCUIT ANALYSIS PROGRAM FOR SMALL COMPUTERS.
M. Valtonen. 1973, 76p S-56

Descriptors: *Computer programs, *Linear circuits, *Network analysis, *Transistor amplifiers, *Transmission lines, Basic (Programming language), Direct current, Domains, Minicomputers, Monte carlo method, Nonlinear systems, Time.

For abstract, see STAR 1213

PAT-APPL-374 830 PC$4.50/MF$1.45
Department of the Air Force Washington D C
METHOD AND APPARATUS FOR SUPPRESSING GRATING LOBES IN AN ELECTRONICALLY SCANNED ANTENNA ARRAY.
Patent Application,
R. J. Mailloux. Filed 29 Jun 73, 26p Rept no.
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Antenna arrays, Patents, Sidelobes, Reduction, Electronic scanners, Phase shift circuits, Power dividers.
Identifiers: *Patent applications, PAT-CL-343-5.

The patent application relates to grating lobe suppression in an electronically scanned antenna array realized by adding odd mode power to the fundamental even mode power that normally drives each radiating element of the array. The odd mode power is maintained plus or minus 90 degrees out of phase with the even mode power at each radiating element aperture. The ratio of even mode power to odd mode power is varied as a function of main beam displacement from broadside. One class of circuit for automatically accomplishing the required functions use waveguide power dividers and phase shifters. An alternative embodiment comprehends the use of passive, reciprocal linear circuitry to perform the power division. In some circuits the phase difference between adjacent radiating elements is used to derive odd and even mode signals.

PAT-APPL-464 723 PC$4.00/MF$1.45
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
ISOLATED OUTPUT SYSTEM FOR A CLASS D SWITCHING-MODE AMPLIFIER.
Patent Application.
M. A. Honnell. Filed 26 Apr 74, 15p NASA-CASE-MFS-21616-1,
Subm-Sponsored by NASA.
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Power amplifiers, *Signal processing, *Switching circuits, Alternating current, Direct current, *Patent applications, Pulse duration modulation, Transformers.

A Class D amplifier is reported for the amplification of signals having uni-polar or bi-polar direct current, or alternating current. The device contains positive and negative signal channels and includes a transformer coupled output circuit for each channel with a switching circuit which effects isolation of the non-operating channel from the operating channel as a function of signal polarity.

PATENT-3 404 348 Not available NTIS
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
LOW LEVEL SIGNAL LIMITER.
Patent.
I. G. Hansen, and V. S. Peterson. Patented 1 Oct 68, 4p NASA-CASE-XLE-04791,
Misc-Filed 22 Sep. 1966.
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Limiter circuits, *Signal processing, Electronic transducers, Operational amplifiers, *Patents, Signal measurement.

A limiting circuit is described which prevents a signal being supplied to a signal amplifier from exceeding a predetermined value. The circuit is designed to permit a signal voltage to be fed directly to a signal amplifier without passing through the operational amplifier and without being altered undesirably. When the signal level increases to the predetermined value, the summing point shifts from the input of the operational amplifier to the output of the limiting circuit.

PATENT-3 811 094 Not available NTIS
National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
BIO-ISOLATED DC OPERATIONAL AMPLIFIER.
Patent.
R. D. Lee. Patented 14 May 74, 4p NASA-CASE-ARC-10596-1,
Misc-Filed 30 Jun. 1972 Supersedes N72-27233 (10 - 18, p 2402).
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Amplifier design, *Bioengineering, *Direct current, *Electrical insulation, Bioelectric potential, Electrical measurement, *Patents.

A bio-isolated dc operational amplifier is described for use in making bioelectrical measurements of a patient while providing isolation of the patient from electrical shocks. The circuit contains a first operational amplifier coupled to the patient with its output coupled in a forward loop through a first optic coupler to a second operational amplifier. The output of the second operational amplifier is coupled to suitable monitoring circuitry via a feedback circuit including a second optic coupler to the input of the first operational amplifier.

SLA-73-1049 PC$6.50/MF$1.45
Sandia Labs., Albuquerque, N.Mex. (Usa).
EVALUATION OF PRE-BOND ETCHANTS IN HYBRID MICROCIRCUIT PROCESSING.
P. H. Holloway, and R. L. Jr. Long. Nov 73, 67p
Contract AT(29-1)-789

Descriptors: (*Microelectronic circuits, *Fabrication), Bonding, Chromium oxides, Compression, Etching.

For abstract, see NSA 30 01, number 02365.

UCRL-51515 PC$4.00/MF$1.45
California Univ., Livermore (Usa). Lawrence Livermore Lab.
COMPUTER MODELS FOR ANTENNAS.
E. K. Miller. 21 Jan 74, 32p
Contract W-7405-Eng-48

Descriptors: (*Antennas, *Mathematical models), Air, Computer codes, Electromagnetic radiation, Ground level, Interfaces, Numerical solution, Programming, Wires.

For abstract, see NSA 30 01, number 02424.

9F. Telemetry

AD-780 868/6GA PC$8.25/MF$1.45
Inter-Range Instrumentation Group White Sands Missile Range N Mex
TELEMETRY STANDARDS (REVISED MAY 1973).
1973, 103p Rept no. IRIG-106-73
Revision of report dated 1971, AD-724 692.

Descriptors: *Telemeter systems, Standards, Guided missile ranges, Telemetering receivers, Telemetering transmitters, Multiplexing, Modulation, Tape recording, Magnetic recording systems, Transducers, Compatibility.

The Telemetry Group of the Range Commanders Council (RCC) prepared the document of standards to foster the compatibility of telemetry transmitting, receiving, and signal processing equipment at all the Test and Evaluation (T+E) ranges under the cognizance of the RCC. The standards provide development and coordination agencies with the necessary criteria on which to base equipment design and modification. The ultimate purpose is to ensure efficient spectrum utilization and interference-free operation of the radio link for telemetry systems at the RCC member ranges.

N74-21799/3GA PC$4.25/MF$1.45
Sensory Systems Lab., Tucson, Ariz.
TELEMETRY LINK FOR AN AUTOMATIC SALMON MIGRATION MONITOR.
Final Technical Report.
H. A. Baldwin, and R. W. Freyman. Oct 73, 24p
NASA-CR-138152
Contract NGR-03-041-008

Descriptors: *Migration, *Schools (Fish), *Telemetry, Acoustic streaming, Antennas, Monitors, Transmitters, Underwater acoustics.

For abstract, see STAR 1213

N74-22500/4GA PC$4.00/MF$1.45
Techtran Corp., Silver Spring, Md.
OPERATIONS ON THE SMS SATELLITE.
P. Foussier. Aug 73, 14p NASA-TT-F-14749, REPT-73/87/PTA
Contract NASW-2485
Tran-Transl. Into Engligh of "Operations sur le Satellite Sms" Centre National d'Etudes Spatiales, Pretoria Station, Rept-73/87/Pta, 1 Jun. 1973 27 p.

Descriptors: *Synchronous meteorological satellite, *Telemetry, Frequency modulation, Pulse modulation, Radio equipment, Signal to noise ratios.

For abstract, see STAR 1213

10. ENERGY CONVERSION (NON-PROPULSIVE)

10A. Conversion Techniques

N74-22604/4GA PC$4.00/MF$1.45
Georgia Inst. of Tech., Atlanta. Schools of Mechanical and Nuclear Engineering.
COMPARATIVE EVALUATION OF SOLAR, FISSION, FUSION, AND FOSSIL ENERGY RESOURCES. PART 5: CONCLUSIONS AND RECOMENDATIONS.
Final Report.
J. R. Williams. 1974, 9p NASA-CR-138183
Contract NGR-11-002-166

Descriptors: *Fissile fuels, *Fossil fuels, *Nuclear fusion, *Solar energy, Air pollution, Carbon dioxide, Energy consumption, Greenhouse effect, Resources management.

For abstract, see STAR 1213

10B. Power Sources

AD-780 598/9GA PC$5.75/MF$1.45
Sci Electronics Inc Huntsville Ala
AIR MOBILE ELECTRICAL MONITOR AND CONTROL SYSTEM STUDY.
Final rept. May 72-Jun 73,
James R. Stansberry. May 74, 225p AFWL-TR-73-145
Contract F29601-72-C-0112

Descriptors: *Electric power plants, Mobile, Airborne, Monitors, Electric power, Control, Systems analysis, Data acquisition, Feasibility studies.

The feasibility in integrating a centralized monitor and control system with the post-1975 air mobility electrical generation and distribution system was investigated. A centralized monitor and control system was found to have several advantages for the power system, which is a dispersed, interconnected system consisting of from two to four generator plants. The monitor and control system can be justified on the basis of manning cost reduction alone for a power system consisting of three or more plants. Several alternative approaches were identified as being applicable to the monitor and control system. The selected system uses wire cable, time-division multiplexing, and baseband modulation as a means of transferring commands and data, and uses a high degree of automatic control at the central station. A conceptual design of the selected system is presented in the report. (Author)

AD-781 021/1GA PC$11.50/MF$1.45
Army Foreign Science and Technology Center Charlottesville Va
THERMODYNAMICS OF LIQUID METAL MHD GENERATORS,
D. D. Kalafati, and V. B. Kozlov. 9 Feb 74, 167p
Rept no. FSTC-HT-23-1306-73
Trans. of mono. Termodinamika Zhidkometa Uicheskikh MGD-Preobrazovatelei, Moscow, 1972 192p.

Descriptors: *Magnetohydrodynamic generators, *Thermodynamics, *Electric power production, Energy conversion, Efficiency, Plasmas(Physics), Liquid metals, Vapor phases, Translations, USSR. Identifiers: *Liquid metal MHD generators.

The book is devoted to the thermodynamics of the magnetohydrodynamic method of conversion of thermal energy into electrical, using liquid metal working fluids. The prospects for use of liquid metal MHD converters in transportation and stationary power engineering, based on nuclear sources, are set forth. Possible thermodynamic cycles, the fields of their use and the basic features of the heat circuits are discussed. A thermodynamic analysis of possible liquid metal MHD converter cycles is carried out, methods of increasing their efficiency are pointed out and analytical solutions are obtained for a number of optimization problems. A section of the book is devoted to prospects for use of the liquid metal MHD converter built-on units to steam turbine installations in a binary energy cycle for stationary atomic electric power stations. (Modified author abstract)

COM-74-11193/1GA PC$20.00/MF$20.00
National Technical Information Service, Springfield, Va.
MAGNETOHYDRODYNAMIC GENERATORS IN POWER GENERATION. A BIBLIOGRAPHY WITH ABSTRACTS.
Rept. for 1964-Jun 74,
David W. Grooms. Jul 74, 82p* NTIS-WIN-74-056

Descriptors: *Bibliographies, *Magnetohydrodynamic generators, *Electric power generation, Steam electric power generation, Nuclear electric power generation, Thermonuclear electric power generation, Cost estimates, Performance evaluation, Efficiency, Plasma physics, Nuclear fusion.

This bibliography contains 68 selected abstracts of research reports retrieved using the NTIS on-line search system--NTISearch. The report presents the results of research in the use of magnetohydrodynamic generators in electric power production. The report includes research in performance costs, efficiency, and design of MHD generators and their use in fusion and fission reactors, and fossil fueled plants.

JPRS-62129 PC$3.00/MF$1.45
Joint Publications Research Service, Arlington, Va.
EXPERIENCE FROM THE FIRST STAGE OF DEVELOPMENT OF THE U-25 INSTALLATION,
A. E. Sheindlin, A. V. Nedospasov, S. A. Pashkov, D. S. Pinkhasik, and S. I. Pishchikov. 31 May 74, 22p
Trans. of mono. Opyt Pervogo Osvoeniya Ustanovki U-25, Moscow, 1973 p1-24.

Descriptors: *Magnetohydrodynamic generators, *Electric power plants, Open cycle MHD generators, Electric power generation, Plasma physics, Translations, USSR.

The report contains a description of the U-25 installation which is an experimental combined power plant with an open-cycle MHD generator.

JPRS-62139 PC$3.00/MF$1.45
Joint Publications Research Service, Arlington, Va.
THE PROSPECTS FOR MHD POWER PLANTS IN POWER ENGINEERING,
V. A. Kirillin, L. A. Melentev, and A. E. Sheindlin. 31 May 74, 20p
Trans. of mono. O Perspektivakh MGD Elektrostantsii v Energetike, Moscow, 1974, pl-21.

Descriptors: *Magnetohydrodynamic generators, *Electric power plants, Electric power generation, Plasma physics, Translations, USSR.

The problem of the future development of the magnetohydrodynamic method of energy conversion and the development, in the near future, of industrial first generation MHD power plants are closely related to research and experimental operation of the first experimental industrial plant with an MHD generator, the U-25 installation. The paper discusses briefly results of the first phase of development of the U-25 installation.

JPRS-62196 PC$3.00/MF$1.45
Joint Publications Research Service, Arlington, Va.
ON THE APPROACHES TO MHD-POWER GENERATION,
A. E. Sheindlin, S. I. Pishchikov, and Yu. M. Volkov. 7 Jun 74, 23p
Trans. of Nauka i Zhizn (USSR) n4 p14-23, 40 Apr 74.

Descriptors: *Magnetohydrodynamic generators, *Electric power generation, Plasma physics, Translations, USSR.

The report contains a round-table discussion by the director of the Institute of High Temperatures and by the chief of the U.25 installation. The topic is magnetohydrodynamic generation of electric power.

N74-21677/1GA PC$4.00/MF$1.45
Scientific Translation Service, Santa Barbara, Calif.
WIND POWER TURBOGENERATOR FOR HIGH ALTITUDE WIND UTILIZATION.
H. Honnef. Apr 74, 12p NASA-TT-F-15455
Contract NASW-2483
Tran-Transl. Into English from German Patent No. 885284(3 Aug. 1953) 4 p.

Descriptors: *High altitude, *Wind velocity, *Windpowered generators, Electric power supplies, Flywheels, Turbogenerators, Wind variations, Windpower utilization.

For abstract, see STAR 1213

N74-21678/9GA PC$4.00/MF$1.45
Kanner (Leo) Associates, Redwood City, Calif.
THE PRESENT STATE OF PLANNING AND ERECTION OF LARGE EXPERIMENTAL WIND-POWER STATIONS.
V. R. Sektorov. Apr 74, 15p NASA-TT-F-15512
Contract NASW-2481
Tran-Transl. Into English from Elektrichestvo (Moscow), No. 2, 1933 p 9-13.

Descriptors: *Energy conversion, *Windpower utilization, *Windpowered generators, Economic factors, Electric power supplies, Energy sources, U.s.s.r..

For abstract, see STAR 1213

N74-21679/7GA PC$4.00/MF$1.45
Kanner (Leo) Associates, Redwood City, Calif.
STUDIES OF THE UTILIZATION OF WIND ENERGY: THE USE OF DC GENERATOR/MERCURY-VAPOR INVERTER SETS CONNECTED TO AC NETWORKS.
A. Asta. Apr 74, 14p NASA-TT-F-15514
Contract NASW-2481
Tran-Transl. Into English from Ric. Sci. (Rome), No. 1-2, Jan. - Feb. 1950 p 53-59.

Descriptors: *Electric generators, *Electric power supplies, *Windpower utilization, *Windpowered generators, Electric networks, Equipment specifications, Performance tests, Windmills (Windpowered machines).

For abstract, see STAR 1213

N74-21680/5GA PC$4.00/MF$1.45
Kanner (Leo) Associates, Redwood City, Calif.
REPORT ON RESULTS ACHIEVED WITH SEAS EXPERIMENTAL MILL.
J. Juul. Apr 74, 15p NASA-TT-F-15515
Contract NASW-2481
Tran-Transl. Into English from Elektroteknikeren (Copenhagen) p 5-12.

Descriptors: *Windmills (Windpowered machines), *Windpower utilization, *Windpowered generators, Electric generators, Electric power supplies, Equipment specifications.

For abstract, see STAR 1213

N74-21681/3GA PC$4.00/MF$1.45
Kanner (Leo) Associates, Redwood City, Calif.
THIS IS HOW YOU CAN HEAT YOUR HOME WITH A LITTLE WINDMILL.
Apr 74, 13p NASA-TT-F-15518
Contract NASW-2481
Tran-Transl. Into English from Nv Teknik (Sweden), No. 3, Jan. 1974 p 8-9.

Descriptors: *Electric equipment, *Heating equipment, *Windpower utilization, *Windpowered generators, Energy conversion, Heat sources, Heat storage, Thermodynamic efficiency.

For abstract, see STAR 1213

N74-21682/1GA PC$4.00/MF$1.45
Kanner (Leo) Associates, Redwood City, Calif.
WIND ELECTRIC POWER STATION.
H. Honnef. Apr 74, 14p NASA-TT-F-15522
Contract NASW-2481
Tran-Transl. Into English from German Patent No. 871580(23 Mar. 1953).

Descriptors: *Electric equipment, *Turbine blades, *Windpower utilization, *Windpowered generators, Electric power supplies, Equipment specifications, Windmills (Windpowered machines).

For abstract, see STAR 1213

N74-21685/4GA PC$9.75/MF$1.45
Heliotek, Sylmar, Calif.
STUDY TERRESTRIAL APPLICATIONS OF SOLAR CELL POWERED SYSTEMS.
Final Report.
J. W. Ravin. Sep 73, 134p NASA-CR-134512
Contract NAS3-16828

Descriptors: *Electric power supplies, *Solar cells, *Solar energy conversion, *Utilization, Equipment specifications, Marketing, Product development, Solar generators.

For abstract, see STAR 1213

PB-232 895/3GA PC$3.25/MF$1.45
Southern Methodist Univ., Dallas, Tex.
DEVELOPMENT OF LOW-COST THIN-FILM POLYCRYSTALLINE SILICON SOLAR CELLS FOR TERRESTRIAL APPLICATIONS.
Quarterly progress rept. no. 1, 1 Jan-31 Mar 74,
Ting I.. Chu. Apr 74, 39p NSF-RANN/SE/GI-38981/PR-74-1, NSF-RA/N-74-032
Grant NSF-GI-38981
Prepared in cooperation with Texas Instruments, Inc., Dallas.

Descriptors: *Solar cells, Thin films, Semiconducting films, Silicon, Polycrystals, Fabrication, Solar power generation.
Identifiers: Schottry barrier devices.

The objective of this research program is to develop low-cost thin-film polycrystalline silicon solar cells suitable for large-scale terrestrial utilization. Specific goals include (1) the deposition and characterization of polycrystalline silicon films suitable for solar cell fabrication, (2) the preparation and characterization of p-n junctions and Schottky barriers, and (3) the fabrication and evaluation of thin film solar cells with efficiencies and cost projections warranting further research and development support.

SLA-73-1087 PC$5.25/MF$1.45
Sandia Labs., Albuquerque, N.Mex. (Usa).
ACCELERATED LIFETESTING OF THIN FILM TUNGSTEN CONTACTS FOR A MILLIWATT SI--GE THERMOPILE.
J. N. Sweet. Apr 74, 45p
Contract AT(29-1)-789

Descriptors: (*Thermoelectric generators, Thermocouples), (*Electric contacts, *Testing), (*Thermocouples, Testing), Germanium alloys, Lifetime, Radioisotope heat sources, Silicon alloys, Temperature dependence, Tungsten.

For abstract, see NSA 30 01, number 00225.

10C. Energy Storage

AD-780 895/9GA PC$5.75/MF$1.45
Power Conversion Inc Mount Vernon N Y
PRIMARY ORGANIC ELECTROLYTE BATTERY BA-584 ( )/U.
Final rept. Jul 72-Dec 73,
Sandors Abens. Mar 74, 54p ECOM-0287-F-72
Contract DAAB07-72-C-0287

Descriptors: *Nonaqueous electrolytes, Lithium, Performance(Engineering), Test methods, Primary batteries, Life expectancy.
Identifiers: *Lithium cells.

Lithium-organic electrolyte batteries equal in size and output voltage to the BA-4386 magnesium battery were built and tested. Of the 307 batteries built on this program, 48 units were subjected to environmental and service life tests. With a cyclic load averaging to about 130 mA, service life was over 120 hours at room temperature. Reduction in service life was about 10% at 125F, 30% at -20F and 50% af -40F. About 95% of initial service life was retained after 30 days of stand at 160F. (Modified author abstract)

AD-780 940/3GA PC$3.25/MF$1.45
Standard Oil Co (Ohio) Cleveland Research and Development Dept
PRODUCTION AND ENGINEERING METHODS FOR CARB-TEK (TRADEMARK) BATTERIES IN FORK LIFT TRUCKS.
Interim rept. Jul 73-Jan 74,
Joseph E. Metcalfe. Mar 74, 28p
Contract DAAK02-73-C-0493

Descriptors: *Storage batteries, *Forklift vehicles, Fused salts, Activated carbon, Lithium alloys, Aluminum alloys, Tellurium compounds, Chlorides.
Identifiers: Molten salt electrolytes, *CARBTEK batteries, Tellurium chlorides.

The Carb-Tek battery employs a porous carbon cathode, a lithium-aluminum alloy anode, a eutectic mixture of potassium chloride and lithium chloride as the electrolyte, and a tellurium tetrachloride additive. This report describes the reconstruction of the Sohio battery pilot line. A great deal of time was spent in cleaning and inspecting equipment and replacing all piping associated with the inert atmosphere system, the molten salt handling system, and the water cooling systems. Pictures showing the present state of the facilities are presented. It is estimated that the battery pilot line is 75% complete. An abbreviated outline of the work to be completed during the second half of the contract is presented. (Modified author abstract)

N74-21688/8GA PC$4.00/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
ELECTRICALLY RECHARGEABLE REDOX FLOW CELLS.
L. H. Thaller. 1974, 6p NASA-TM-X-71540, E-7922
Conf-Proposed for Presentation at 9TH Intersoc. Energy Conversion Eng. Conf., San Francisco, 26-30 Aug. 1974.

Descriptors: *Electric cells, *Oxidation, *Reduction (Chemistry), Electrodes, Energy conversion, Pumps, Water.

For abstract, see STAR 1213

SLA-73-7069 PC$4.00/MF$1.45
Sandia Labs., Albuquerque, N.Mex. (Usa).
LONG-LIFE, LOW-VOLTAGE, POWER THERMAL BATTERY.
A. R. Baldwin. 1973, 19p CONF-740407-1

Descriptors: (*Thermal batteries, *Design), Fabrication, Molten salts, Performance testing, Telemetry.

For abstract, see NSA 30 01, number 02415.

SLA-74-5002 PC$4.00/MF$1.45
Sandia Labs., Albuquerque, N.Mex. (Usa).
RESULTS OF THERMAL BATTERY CELL TESTING.
D. M. Bush. 1973, 11p CONF-740407-2

Descriptors: (*Thermal batteries, *Performance testing), Design, Fabrication, Molten salts, Nuclear weapons, Telemetry, Temperature dependence.

For abstract, see NSA 30 01, number 02370.

SLA-74-5046 PC$4.00/MF$1.45
Sandia Labs., Albuquerque, N.Mex. (Usa).
POWER THERMAL BATTERY FOR ARTILLERY.
K. R. Grothaus. 14p CONF-740407-3

Descriptors: Design, Equipment, Fabrication, Molten salts, National defense, Nuclear weapons, Telemetry, Thermal batteries.

For abstract, see NSA 30 01, number 02371.

11. MATERIALS

11A. Adhesives and Seals

AD-780 713/4GA PC$6.00/MF$1.45
Army Foreign Science and Technology Center Charlottesville Va
HANDBOOK OF SOVIET ADHESIVES,
Howard Jaffe, Gus G. Orpanides, and Arthur F. Readdy, Jr. Apr 74, 245p* Rept no. FSTC-HB-01-100-74

Descriptors: *Handbooks, *Adhesives, *USSR, Polymers, Styrene plastics, Thermoplastic resins, Elastomers.

The report presents a narrative analysis of Soviet conventional and high-performance adhesive and tabular data on the properties, compositions, designations, and characteristics of the adhesive material. It presents potential or known uses of the adhesives, including glue welding technology. Comparative analysis of US and USSR adhesives programs is presented in a tabular form. A tabulation of major institutes and key personnel conducting adhesives research is presented. (Author)

AD-781 005/4GA PC$10.00/MF$1.45
General Motors Corp Indianapolis Ind Detroit Diesel Allison Div
EXPLORATORY INVESTIGATION FOR REDUCING LABYRINTH SEAL LEAKAGE IN HIGH PRESSURE RATIO GAS TURBINES.
Final rept. 1 Aug 72-31 Aug 73,
H. L. Stocker. Sep 73, 140p Rept no. DDA-EDR-7968
Contract N00140-73-C-0005

Descriptors: *Gas turbines, *Rotary seals, Leakage(Fluid), Experimental design, Configurations, Flow visualization, Dynamic tests.
Identifiers: *Labyrinth seals.

The attendant problem of labyrinth seal air leakage in current and advanced high pressure ratio gas turbines is directly related to the limitations of current gas turbine dynamic seal technology. A method of improving the efficiency of labyrinth seals which does not violate mechanical design constraints involves increasing the internal cavity turbulence of the seal. Therefore, an exploratory investigation was undertaken to conceive, design, fabricate, and test several unique labyrinth seal configurations. (Modified author abstract)

N74-22224/1GA PC$6.25/MF$1.45
TRW Systems Group, Redondo Beach, Calif.
FEASIBILITY STUDY FOR THE DEVELOPMENT OF LOW TEMPERATURE CURING ADHESIVES.
Final Report, 16 May 1973 - 16 Feb. 1974.
H. E. Green, J. D. Sutherland, and C. H. Sheppard. May 74, 62p NASA-CR-132422, TRW-22743-6009-RU-00
Contract NAS1-12309

Descriptors: *Adhesives, *Feasibility analysis, *Low temperature, Curing, Resins, Room temperature, Shear strength, Thermal stability.

For abstract, see STAR 1213

N74-22225/8GA PC$13.00/MF$1.45
Southern Research Inst., Birmingham, Ala.
THE THERMAL AND MECHANICAL PROPERTIES OF A LOW-DENSITY GLASS-FIBER-REINFORCED ELASTOMERIC ABLATION MATERIAL.
W. T. Engelke, R. W. Robertson, A. L. Bush, and C. D. Pears. May 74, 200p NASA-CR-132426
Contract NAS1-11499

Descriptors: *Ablative materials, *Composite materials, *Elastomers, *Glass fibers, *Materials tests, Charging, High temperature tests, Mechanical properties, Thermodynamic properties.

For abstract, see STAR 1213

PATENT-3 607 370 Not available NTIS
Department of Agriculture, Washington, D.C.
PRESSURE-SENSITIVE ADHESIVE TAPE COMPRISING GLUTEN HYDROLYSATE DERIVATIVES.
Patent, *Filed 21 May 69, patented 21 Sep 71, Catherine Aranyi, Kurt Gutfreud, Ervin J. Hawrylewicz, and Joseph S. Wall. 21 Sep 71, 2p PAT-APPL-842 061,
Previously filed as PAT-APPL-680 030, 2 Nov 67.
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Adhesive tapes, *Pressure sensitive adhesives, *Glutens, *Acrylate copolymers, Epoxy compounds, Peel tests, Methacrylates, Hydrolysis, Peptides.
Identifiers: PAT-CL-117-122-P.

The patent describes a pressure-sensitive adhesive tape. The backing is a pressure-sensitive coating comprising epoxy derivatives of the large peptide fraction of partially hydrolyzed gluten polymerized with various acrylic compounds.

11B. Ceramics, Refractories, and Glasses

AD-780 704/3GA PC$3.00/MF$1.45
National Bureau of Standards Washington D C Inst for Materials Research
STRENGTH OF GLASS--A FRACTURE MECHANICS APPROACH.
Interim rept. 1 Jul 73-30 Jun 74,
S. M. Wiederhorn. May 74, 18p Rept no. NBSIR-74-485

Descriptors: *Glass, *Fracture(Mechanics), Fatigue(Mechanics), Crack propagation.

After a brief review of those factors that determine the strength of glass (brittleness, surface flaws, susceptibility to stress corrosion cracking), a discussion is given of how fracture mechanics techniques can be used to understand the physics and chemistry of glass strength. In this paper it is assumed that the strength of glass is limited by the growth of cracks that are always present in normal glass surfaces. Fracture mechanics techniques can be used to characterize the crack growth and to relate the growth to experimental parameters such as temperature, environment and glass composition. Crack growth data obtained in this manner can be used to develop a deeper understanding of fracture mechanisms, and to develop charts that can be used for the design of glass structural components. Examples of both applications are given. (Author)

AD-780 705/0GA PC$3.75/MF$1.45
National Bureau of Standards Washington D C Inst for Materials Research
RELIABILITY, LIFE PREDICTION AND PROOF TESTING OF CERAMICS.
Interim rept. 1 Jul 73-30 Jun 74,
S. M. Wiederhorn. May 74, 56p Rept no. NBSIR-74-486

Descriptors: *Ceramic materials, Failure, Predictions, Fracture(Mechanics), Crack propagation, Structures.
Identifiers: *Proof tests.

A critical review is presented of the use of proof testing as a design method for assuring the reliability of structural components. The advantage of proof testing over the statistical approach used for design lies in the insensitivity of the proof testing method to the detailed history of handling or processing of structural components. Methods are presented for developing and using proof test diagrams to assure component lifetime after proof testing. Procedures of proof testing and precautions that must be followed during proof testing are discussed. Provided these precautions are followed, proof testing offers a general method for assuring the reliability of structural components under stress. (Author)

AD-780 826/4GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
STUDY OF HEATPROOF MATERIALS IN NON-STEADY-STATE OPERATING CONDITIONS,
B. M. Pankratov, O. M. Alifanov, A. A. Ivanov, and A. D. Markin. 30 Apr 74, 16p Rept no. FTD-HT-23-909-74
Edited trans. of Inzhenero-Fizicheskii Zhurnal (USSR) v24 n1 p75-83 Jan 73, by Rene E. Courville.

Descriptors: *Ablation, *Coatings, *Composite materials, Reentry vehicles, Heat transfer, Finite difference theory, Translations, USSR.

The present paper deals with the problem of transient heating and abalation of heat-proof coatings of flight vehicles. An analysis is made of the effect of transient parameters on the characteristics of hypersonic ablation and heating of glassy coatings. An implicit finite-difference procedure of calculation of unsteady thermal conditions at the boundary of a plate whose properties are dependent on temperature is presented. (Modified author abstract)

AD-781 004/7GA PC$6.00/MF$1.45
Pratt and Whitney Aircraft East Hartford Conn
ADVANCED CERAMIC SEAL PROGRAM (PHASE I).
Final rept. 15 Aug 72-30 Sep 73 on Phase 1,
P. W. Schlike. Apr 74, 60p Rept no. PWA-6635
Contract N00140-73-C-0320

Descriptors: *Seals, *Aircraft equipment, *Gas turbines, *Ceramic materials, Zirconium oxides, Silicon carbides, Silicon nitrides, Yttrium oxides, Thermal properties, Elastic properties, Thermal shock, Erosion, Abrasion.

Screening of candidate ceramic seal materials was conducted to select the most promising systems for turbine seal component development. Vendor screening coupled with a literature search and preliminary thermal analysis identified five ceramic seal systems and one blade tip system for testing and evaluation in this contract. The ceramic seal materials were divided into two categories (1) insulative ceramic materials which could be applied to a metallic substrate and (2) structural ceramic materials to be mechanically held in place. Yittria stabilized zirconia was selected as the primary insulative ceramic material and reaction sintered silicon nitride was selected as the primary structural ceramic material to be used in these systems. Physical properties measurements of: coefficient of thermal expansion, thermal conductivity, and modulus of elasticity were performed on the selected seal materials. Thermal shock, oxidation/erosion and abradability were conducted on the seal and blade tip systems. Analysis of the test results and thermal and stress analysis under advanced engine conditions resulted in the selection of the best graded metal/ceramic system and the best structural system for turbine seal component development. Hot pressed silicon nitride and hot pressed silicon carbide were also analyzed for thermal and stress levels under advanced engine conditions. The recommended systems are: System 3 (yittria/calcia stabilized zirconia graded with a nickel chromium metallic constituent and brazed to a metallic substrate) and hot pressed silicon carbide. (Author)

COO-3420-3 PC$4.00/MF$1.45
Pennsylvania State Univ., University Park (Usa). Dept. Of Material Sciences.
CERAMIC RESEARCH ON TRANSFORMATIONAL SUPERPLASTICITY AND STOICHIOMETRY EFFECTS ON FRACTURE. RESEARCH PROGRESS REPORT, JUNE 1, 1973--MAY 31, 1974.
R. C. Bradt, and J. H. Hoke. 1 Mar 74, 17p
Contract AT(11-1)-3420

Descriptors: (*Bismuth oxides, *Plasticity), (*Samarium oxides, Plasticity), (*Bismuth compounds, Plasticity), (*Tungstates, Plasticity), Chemical composition, Quantity ratio, Fracture properties, Stoichiometry, Titanium oxides, Eutectics, Phase transformations.

For abstract, see NSA 30 01, number 00775.

SLA-73-5677 PC$4.00/MF$1.45
Sandia Labs., Albuquerque, N.Mex. (Usa).
HEAT TRANSFER IN HIGH TEMPERATURE OPACIFIED FIBER INSULATION.
L. G. Rainhart, R. U. Acton, and A. B. Donaldson. 1973, 16p CONF-731106-6

Descriptors: (*Space vehicles, *Thermal insulation), (*Carbon, *Heat transfer), Ablation, Composite materials, Fibers, Graphite, Reentry, Very high temperature.

For abstract, see NSA 30 01, number 02366.

SLL-74-5210 PC$4.75/MF$1.45
Sandia Labs., Livermore, Calif. (Usa).
GAS MIGRATION IN GLASS.
J. E. Shelby. Mar 74, 33p CONF-740417-1
Contract AT(29-1)-789

Descriptors: (*Gases, *Mobility), (*Hydrogen, Mobility), Compression, Glass, Solubility, Stresses, Tensile properties, Volume.

For abstract, see NSA 30 01, number 02373.

11C. Coating, Colorants, and Finishes

AD-780 775/3GA PC$3.00/MF$1.45
Naval Air Development Center Warminster Pa Air Vehicle Technology Dept

SILICONE WAX REMOVAL FROM PAINTED SURFACES.
Phase rept.,
G. Pilla. 2 Apr 74, 11p Rept no. NADC-74042-30

Descriptors: *Waxes, *Silicones, *Removal, Aircraft, Solvents.

A simplified procedure for the removal of silicone wax from painted aircraft surfaces prior to paint touch up operations is described. (Author)

BDX-613-931(Rev.) PC$7.00/MF$1.45
Bendix Corp., Kansas City, Mo. (Usa).
PROTECTION OF GLASS TUBES IN EPOXY ENCAPSULATION.
J. W. Steele. Mar 74, 78p
Contract AT(29-1)-613

Descriptors: (*Silicones, *Protective coatings), (*Glass, *Thermal cycling), (*Rubbers, Protective coatings), Design, Electron tubes, Epoxides, Failures, Surface coating.

For abstract, see NSA 30 01, number 02310.

BDX-613-960(Rev.) PC$4.25/MF$1.45
Bendix Corp., Kansas City, Mo. (Usa).
INVESTIGATION OF POLYSULFIDE CONFORMAL COATING. FINAL REPORT.
C. J. Camp. Mar 74, 21p
Contract AT(29-1)-613

Descriptors: (*Sulfides, *Protective coatings), Chemical analysis, Compression, Electronic equipment, Epoxides, Foams, Heating, Performance testing, Specifications, Stability, Stresses, Temperature dependence, Weight.

For abstract, see NSA 30 01, number 02311.

CEA-CONF-2534 PC$3.00/MF$1.45
Cea Centre d'Etudes Nucleaires de Grenoble, 38 (France). Dept. De Metallurgie.
CHEMICAL VAPOR DEPOSITION AT LOW TEMPERATURES.
J. C. Viguie, and J. Spitz. 18 Jun 73, 12p CONF-731066-1

Descriptors: (*Glass, *Substrates), (*Iron oxides, *Vapor deposited coatings), High temperature, Layers, Thickness.

For abstract, see NSA 30 01, number 02273.

N74-22227/4GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
THE EFFECTS OF PARTICLE SIZE ON THE OPTICAL PROPERTIES AND SURFACE ROUGHNESS OF A GLASS-BALLOON-FILLED BLACK PAINT.
T. Heslin, J. Heaney, and M. Harper. May 74, 9p
NASA-TN-D-7643, G-7432

Descriptors: *Optical properties, *Paints, *Particle size distribution, *Reflectance, Materials tests, Pigments, Protective coatings, Thermal control coatings.

For abstract, see STAR 1213

PATENT-3 188 223 Not available NTIS
Department of Agriculture, Washington, D.C.
PROTEIN-POLYMERIC DIALDEHYDE COMPOSITIONS AND PROCESS OF COATING A BASE THEREWITH.
Patent, *Filed 14 Nov 60, patented 8 Jun 65,
Francis B. Weakley, and Charles L. Mehltretter. 8 Jun 65, 4p PAT-APPL-69 237,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Copolymers, *Aldehyde polymers, *Proteins, *Waterproof coatings, Caseins, Starches, Papers, Leather, Textiles.
Identifiers: PAT-CL-106-139, Copolymerization.

The invention relates to water resistant protein-polymeric dialdehyde compositions and to an improved process for the preparation of water resistant polymeric dialdehyde-modified proteins. A further object of this invention is to obtain improved resistance to penetration of aqueous liquids of acid, neutral, or alkaline nature by applying the novel protein-dialdehyde copolymer as a surface sizing or coating solution or dispersion to base materials. Modifying proteins by reaction with a highly polymeric dialdehyde in aqueous dispersion in the pH range 6-7.5 produces a substituted protein or copolymer of high molecular weight having value as a coating composition for paper, leather and textiles.

11D. Composite Materials

AD-780 612/8GA PC$8.50/MF$1.45
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Engineering
HARD-BODY IMPACT DAMAGE EFFECTS ON BORON-ALUMINUM COMPOSITES.
Master's thesis,
John G. Carlisle. Mar 74, 106p Rept no. GAM/MC/74-M-1

Descriptors: *Fiber reinforced composites, Boron, Aluminum alloys, Damage, Impact, Impact tests, Fatigue(Mechanics), Tensile strength, Fracture(Mechanics), Theses, Titanium alloys, Vanadium alloys.
Identifiers: *Boron reinforced composites, Aluminum matrix composites, Oriented fiber composites, Aluminum alloy 6061, Titanium alloy 6Al 4V.

The investigation was conducted to study the effects of foreign object damage on the residual tensile and tensile fatigue strength of a composite material, unidirectional boron-aluminum-6061. Curves were generated for various levels of tensile prestress during the ballistic impaction which related velocity of impact with the residual tensile strength of the specimens. The composite material was further characterized by tensile fatigue tests, radiography, and photography. A similar damage and fatigue analysis was done for Ti-6Al-4V to provide baseline data with which to compare the composite. All tests were carried out in lab air and at room temperature. It was concluded that for a given level of impact damage B/Al-6061 suffers much greater total loss and percentage loss of residual tensile strength than does Ti-6-4. Also, a fracture mechanics model fits the failure stress versus crack length data for B/Al-6061 resulting from hard-body impact. (Author)

AD-780 628/4GA PC$9.00/MF$1.45
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Engineering
SOFT BODY IMPACT DAMAGE EFFECTS ON BORON-ALUMINUM COMPOSITES.
Master's thesis,
William J. Jaques. Mar 74, 119p Rept no. GAW/MC/74-13

Descriptors: *Fiber reinforced composites, Boron, Aluminum alloys, Damage, Impact, Tensile strength, Fatigue(Mechanics), Impact tests, Fracture(Mechanics), Theses.
Identifiers: *Boron reinforced composites, Aluminum matrix composites, Oriented fiber composites.

The purpose of the experimental study was to investigate and document the effects of soft body impact damage on the residual tensile and axial fatigue strength of Boron-6061 Aluminum composite material. Unidirectional B-6061 Al specimens were impacted with room temperature vulcanizing rubber (TVR) spheres in a powder charge gun facility. Specimens were also impacted under five different tensile loads. Residual tensile strength versus impact velocity plots were generated for each prestress level. The composite was further characterized by axial fatigue and nondestructive tests. All tests were carried out at room temperature. A similar damage and residual strength analysis was done for Ti-6Al-4V to provide baseline data against which to compare the composite. It was concluded that Ti-6Al-4V is much more resistant to impact damage that unidirectional B-6061 Al. A fracture mechanics analysis is presented and a fracture mechanics model proposed for unidirectional B-6061 Al impacted specimens. (Author)

AD-780 701/9GA PC$3.75/MF$1.45
Whittaker Corp San Diego Calif Research and Development Div
ANALYTICAL PARAMETRIC STUDY OF LOW VELOCITY ON IMPACT ON HIGH MODULUS, ORTHOTROPIC COMPOSITE STRUCTURES.
Final rept. Jan-Jun 74,
Kenneth R. Berg. Jun 74, 67p Rept no. WRD-SDE-74-61
Contract DAAA21-74-C-0246

Descriptors: *Fiber reinforced composites, *Impact, Plates, Numerical analysis, Loads(Forces).

An analytical parametric study of low velocity impact on orthotropic plates and tubes was conducted. Relationships were established between the dynamic structural deflection and the impact parameters such as impactor mass, velocity, height of drop, energy level, etc. The severity of the loading on the structure was determined relative to the impact parameters and the natural frequency (first mode) of the structure. (Author)

AD-780 730/8GA PC$4.00/MF$1.45
Southwest Research Inst San Antonio Tex
BALLISTIC PENETRATION EFFECTS ON BIAXIALLY LOADED GRAPHITE/EPOXY COMPOSITE PANELS.
Contractor rept. Sep 72-Sep 73,
P. H. Francis, A. Nagy, H. G. Pennick, and H. H. Calvit. Apr 74, 78p BRL-CR-148
Contract DAAD05-73-C-0017

Descriptors: *Composite materials, *Panels, Ballistics, Impact, Epoxy resins, Carbon fibers, Graphite, Laminates, Airframes, Strength(Mechanics), Stresses, Loads(Forces), Penetration.

The behavior of laminated plates of graphite/epoxy subjected to 0.30 cal. AP projectile impact was studied experimentally and analytically. The threshold strength and residual strength of these panels were determined, and, in the process, some measure of the cumulative effects of bending, shear and compression waves in the plates was obtained from the difference between the threshold and the residual strengths. (Author)

AD-781 130/0GA PC$3.25/MF$1.45
Washington Univ St Louis Mo Materials Research Lab
BASIC FAILURE OF COMPOSITES. PART I. DATA AVERAGING OF ANISOTROPIC COMPOSITE MATERIAL CONSTANTS.
Technical rept. 1 May 71-1 May 72,
Edward M. Wu, and R. E. Lavengood. Nov 73, 42p AFML-TR-73-272-Pt-1
Contract F33615-71-C-1404
See also Part 2, AD-781 131.

Descriptors: *Composite materials, *Tensor analysis, Failure, Elastic properties, Expansion, Measurement, Orientation(Direction), Test methods, Anisotropy, Predictions.

Material parameters which are dependent on direction of orientation can best be represented by tensors of appropriate ranks. Using tensor transformation rule and associated scalar invariants of

the tensor, experimental data can be averaged and reduced to compact constants for engineering documentation and retrieval. Examples on data averaging of composite swelling coefficients and of elastic compliances illustrate the simplicity and viability of this tensor averaging methodology. (Author)

AD-781 131/8GA PC$3.75/MF$1.45
Washington Univ St Louis Mo Materials Research Lab
BASIC FAILURE OF COMPOSITES. PART II. DIAGNOSTIC EXPERIMENT FOR LAMINATE FAILURE.
Technical rept. 1 May 72-1 Apr 73,
Edward M. Wu, and James Scheublein. Nov 73,
58p AFML-73-272-Pt-2
Contract F33615-71-C-1404
See also Part 1, AD-781 130.

Descriptors: *Fiber reinforced composites, *Laminates, *Tensor analysis, Failure, Predictions, Carbon fibers, Epoxy resins, Stress strain relations, Test methods.
Identifiers: Graphite reinforced composites, Epoxy matrix composites.

Diagnostic experiments indicated that given a reliable lamina failure criterion, the laminated plate theory can provide a reasonable prediction of the laminate failure. Additional refinements lie in the areas of (1) accounting for nonlinear stress-strain relationships in laminated plate theory, (2) analyzing in detail the intra-lamina stresses, (3) using experimental capabilities of external pressure for tubular specimens and (4) developing the higher order failure tensor for direct phenomenological failure characterization. (Author)

JPRS-62051 PC$3.00/MF$1.45
Joint Publications Research Service, Arlington, Va.
CERAMICS REINFORCED WITH SINGLE CRYSTALS OF MULLITE,
D. M. Karpinos, V. M. Grosheva, Yu. I. Morozov, and A. I. Ilchenko. 22 May 74, 7p
Trans. of Steklo i Keramika (USSR) n3 p26-27 1974.

Descriptors: *Ceramic composites, *Fibers, *Mullite, *Single crystals, Translations, USSR.

This Russian translation reviews the reinforcement of ceramic materials with mullite fibers.

N74-21656/5GA PC$5.25/MF$1.45
United Aircraft Corp., Stratford, Conn. Sikorsky Aircraft.
EVALUATION OF GRAPHITE COMPOSITE MATERIALS FOR BEARINGLESS HELICOPTER ROTOR APPLICATION.
M. G. Ulitchny, and J. J. Lucas. Jan 74, 44p
NASA-CR-132414
Contract NAS1-12622

Descriptors: *Composite materials, *Graphite, *Rotary wings, *Stress analysis, Fatigue tests, Product development, Vibration effects.

For abstract, see STAR 1213

N74-22226/6GA PC$6.50/MF$1.45
Sheldahl Co., Northfield, Minn. Advanced Products Div.
INVESTIGATION OF KEVLAR FABRIC BASED MATERIALS FOR USE WITH INFLATABLE STRUCTURES.
R. J. Niccum, and J. B. Munson. Apr 74, 67p
NASA-CR-132411
Contract NAS1-11694

Descriptors: *Composite materials, *Inflatable structures, *Synthetic fibers, *Textiles, Elastic properties, Materials tests, Product development.

For abstract, see STAR 1213

N74-22228/2GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
EFFECTS OF SIMULATED SPACE ENVIRONMENT ON SKYLAB PARASOL MATERIAL.
W. S. Slemp. May 74, 19p NASA-TM-X-2965, L-9344

Descriptors: *Aluminum coatings, *Mylar (Trademark), *Shielding, *Skylab program, *Solar radiation, *Solar simulators, *Space stations, High temperature tests, Materials tests, Mechanical properties, Service life, Thermodynamic properties.

For abstract, see STAR 1213

N74-22541/8GA PC$4.75/MF$1.45
Materials Sciences Corp., Blue Bell, Pa.
NON-LINEAR BEHAVIOR OF FIBER COMPOSITE LAMINATES.
Z. Hashin, D. Bagchi, and B. W. Rosen. Apr 74, 130p NASA-CR-2313, TFR/7309
Contract NAS1-11284

Descriptors: *Laminates, *Mechanical properties, *Reinforcing fibers, Deformation, Matrices (Mathematics), Numerical analysis, Shear stress, Stress-strain diagrams.

For abstract, see STAR 1213

PAT-APPL-276 211 PC$4.00/MF$1.45
Atomic Energy Commission, Washington, D.C. Assistant General Counsel for Patents.
GLASS POLYMER COMPOSITES.
Patent Application,
Meyer Steinberg, Peter Colombo, and Gerald Farber. Filed 28 Jul 72, 12p
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Patent applications, *Reinforced plastics, *Composite fabrication, *Solid waste disposal, Reclamation, Sewer pipes, Polymerization, Crushing.
Identifiers: *Glass recycling.

The invention describes an improved sewer pipe and similar articles of construction which are corrosion resistant and can be manufactured from the waste glass products commonly found in the solid wastes of a typical municipal sewage system. The waste glass, which is in particulate form, is bonded with a plastic polymer prepared in situ. The glass, which is derived from broken bottles and the like and which may even include the bottle caps and the paper labels, may be graded after crushing by sieving in sizes such that when the sizes are mixed together a minimum void volume is obtained. The crushed and graded glass is poured into a form shaped into that of the final product and is then impregnated by monomer which contains a suitable additive, agitated to remove entrapped air, and then in situ polymerized.

UCRL-75209 PC$3.00/MF$1.45
California Univ., Livermore (Usa). Lawrence Livermore Lab.
TENSILE PROPERTIES OF AN ULTRAHIGH-STRENGTH GRAPHITE FIBER IN AN EPOXY MATRIX.
T. T. Chiao, M. A. Hamstad, and E. S. Jessop. 12 Dec 73, 15p CONF-740411-1

Descriptors: (*Graphite, Fibers), (*Fibers, *Tensile properties), Acoustic emission testing, Composite materials, Epoxides, Failures, Matrices, Space vehicles, Stresses.

For abstract, see NSA 30 01, number 02377.

11E. Fibers and Textiles

AD-780 831/4GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
THE INVESTIGATION OF CERTAIN THERMOPLASTIC PROPERTIES OF CAPRON FABRICS,
E. P. Turchinskaya, and A. I. Pavlov. 10 Jun 74, 10p Rept no. FTD-HC-23-1549-74
Edited trans. of Izvestiya Vysshikh Uchebnykh Zavedenii. Tekhnologiya Legkoi Promyshlennosti (USSR) n4 p35-39 1965.

Descriptors: *Fabrics, *Nylon, *Plastic properties, High temperature, Translations, USSR.

AD-781 111/6GA PC$3.00/MF$1.45
Royal Aircraft Establishment Farnborough (England)
A STUDY OF THE STRUCTURE OF CARBON FIBRES USING THE SCANNING ELECTRON MICROSCOPE (ISSLEDOVANIE STRUKTURY UGLERODNYKH S POMOSCHCHYU SKANIRUYUSHCHEGO ELEKTRONNOGO MIKROSKOPA),
A. S. Fialkov, B. N. Smirnov, N. V.Bondarenko, N. V.Polyakova, and V. A. Mikhailova. Apr 74, 9p Rept no. RAE-Library Trans-1752 DRIC-BR-41244
Trans. of Mekhanika Polimerov (USSR) n5 p925-926 1972, by G. H. Kinner.

Descriptors: *Carbon fibers, *Microstructure, Electron microscopy, Surfaces, Cellulose, Polymers, Translations, USSR.
Identifiers: Scanning electron microscopy.

A study has been made of the structure of carbon fibers from hydrocellulose and Polymers (PAN) after heat treatment in the temperature range 800-3000C and of carbonized fibers from PAN after oxidation in air. It has been established that substantial change in surface structure takes place after heat treatment at a temperature of 2600C or higher. Structural changes in carbonized fibers after different degrees of oxidation are shown. Data are also given on change of surface structure and the formation of porous structure in carbons during oxidation under defined conditions. (Author)

PATENT-3 801 350 Not available NTIS
Department of the Air Force Washington D C
HIGH MODULUS GRAPHITE FIBERS HAVING IMPROVED BONDING PROPERTIES.
Patent,
Richard J. Dauksys. Filed 5 May 72, patented 2 Apr 74, 4p Rept nos. PAT-APPL-250 714,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Carbon fibers, *Patents, Graphite, Composite materials, Epoxy resins, Fiber reinforced composites, Bonding, Treatment, Solutions(Mixtures), Tin compounds, Chlorides, Sodium compounds, Iodates.
Identifiers: PAT-Cl.-117-47-R.

The patent describes a process for improving the bonding properties of high modulus graphite fibers. The process comprises treating the fibers with a solution of sodium iodate in aqueous dioxane; washing and drying the treated fibers; contacting the treated fibers with a solution of tin tetrachloride in 2-butanone; and heating the fibers to remove the 2-butanone. An epoxy resin composite having a greatly improved interlaminar shear strength is obtained when the treated graphite fibers are employed as a reinforcing material for epoxy resins.

PATENT-3 801 351 Not available NTIS
Department of the Air Force Washington D C
TREATMENT OF HIGH MODULUS GRAPHITE FIBERS TO IMPROVE THEIR BONDING CHARACTERISTICS.
Patent,
Richard J. Dauksys. Filed 5 May 72, patented 2 Apr 74, 4p Rept nos. PAT-APPL-250 715,

Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Carbon fibers, *Patents, Graphite, Composite materials, Epoxy resins, Fiber reinforced composites, Bonding, Treatment, Solutions(Mixtures), Osmium compounds, Ruthenium compounds, Tetroxides, Sodium compounds, Iodates, Tin compounds, Chlorides.
Identifiers: PAT-CL-117-47-R.

The patent describes a method of improving the bonding characteristics of high modulus graphite fibers. It comprises treating the fibers with a solution of osmium or ruthenium tetroxide and sodium iodate in water, dioxane or aqueous dioxane; washing and thereafter drying the treated fibers; contacting the treated fibers with a solution of tin tetrachloride in 2-butanone; and heating the fibers to remove the 2-butanone solvent. When graphite fibers so treated are used as a reinforcing material for epoxy resins, a composite is obtained that has a greatly improved interlaminar shear strength.

PB-232 881/3GA PC$4.00/MF$1.45
North Carolina State Univ., Raleigh. Dept of Textile Chemistry.
A STUDY OF THE TRANSFORMATION OF SPIDER POLYPEPTIDES TO SILK FIBERS.
Interim summary rept. 1 Jul 72-31 May 74,
Robert W. Work. 29 May 74, 7p
Grant NSF-GK-33935

Descriptors: *Spiders, *Silk, *Animal fibers, Peptides, Spinning(Extruding), Filament drawing, Elastic properties, Mechanical properties, Consistency, Phase transformations, Webs(Supports), Elongation, Glands(Anatomy).

Based upon improved techniques for sampling, measurement and certainty of sources of ampullate silk from orb web spinning spiders, it has been concluded that the wide range of physical properties obtainable from this single source are real. Anatomical studies show that the transformation of the liquid polypeptide to a strong, elastic, relatively intractable silk is a complex phenomenon and does not necessarily occur at one location in the ampullate gland system. The liquid-solid transformation of the polypeptide has been accomplished in vitro by pressure and shearing.

11F. Metallurgy and Metallography

AD-780 596/3GA PC$10.75/MF$1.45
National Bureau of Standards Boulder Colo Cryogenics Div
MATERIALS RESEARCH IN SUPPORT OF SUPERCONDUCTING MACHINERY.
Semi-Annual rept. 1 Sep 73-1 Mar 74,
Mar 74, 567p* Rept no. NBSIR-74-359
ARPA Order-2569

Descriptors: *Superconductors, Composite materials, Stainless steel, Tianium alloys, Nickel alloy Inconel, Thermal conductivity, Magnetic fields, Fatigue(Mechanics), Fracture(Mechanics), Toughness, Tensile properties, Elastic properties, Cryogenics, Crack propagation, Aluminum alloys, Vanadium alloys, Tin alloys.
Identifiers: Fiberglass reinforced plastics, Steel 304, Steel 316, Steel A286, Titanium alloy 5Al 4V, Titanium alloy 6Al 2-1/2Sn.

Results of six months research are reported. Subjects include magneto-thermal conductivity, thermal conductivity, composites, elastic properties, fracture toughness, fatigue, and tensile. All measurements include the temperature range 4 to 300K. Materials examined are those either presently being used in superconducting machinery or considered for use in future prototypes. Material classes include stainless steels, inconels, titanium alloys, and composites. Special results include: the thermal conductivity in a magnetic field is considerably lower than would be predicted; a comprehensive review of glass-reinforced composite behavior at low temperatures is included; the elastic moduli of 12 engineering alloys from 4 to 300K are reported; and fracture toughness and fatigue crack growth rate data on AISI 304, AISI 316, A286, Ti-5Al-4V and Ti-6Al-2.5Sn at 4, 76 and 300K have been measured. (Author)

AD-780 630/0GA PC$9.25/MF$1.45
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Engineering
DEVELOPMENT OF TIAL BY EXTRUSION OF ELEMENTAL POWDER MIXTURE.
Master's thesis,
Robert E. Schafrik. Mar 74, 124p Rept no. GAW/MC/74-16

Descriptors: *Titanium alloys, *Powder metallurgy, Aluminum alloys, Powder alloys, Extrusion, Microstructure, Alloys, Heat treatment, Mechanical properties, Theses.

The experimental study investigated the preparation of TiAl (gamma-phase) directly from a mixture of the elemental powders. Selected properties of this material were compared with those of TiAl manufactured from prealloyed powders. Densification of the powders was achieved by direct extrusion at an elevated temperature. The powders were extruded while encased in a titanium billet. The process variables that were investigated were: pre-sinter conditions, heat treating conditions, and effect of extrusion conditions on the physical properties of the product. (Modified author abstract)

AD-780 733/2GA PC$3.25/MF$1.45
Lehigh Univ Bethlehem Pa
MEASUREMENT OF STRAIN RATE EFFECTS IN METALS.
Final rept.,
Wesley R. Smith. Apr 74, 38p BRL-CR-150
Contract DAAD05-72-C-0406

Descriptors: *Strain rate, *Impact tests, Shock tubes, Wave propagation, Plastic deformation, Aluminum, Strain gages, Mathematical models, Measurement.

A new shock tube technique has demonstrated the existence of strain rate effects in the plastic deformation of metals. A transient deformation is produced in a thin-walled cylindrical metal tube loaded by a plane air shock wave propagating inside it. Surface strain gauges allow a direct measurement of the shock-produced transient strain. Preliminary experiments with annealed aluminum tubes have demonstrated the existence of strain relaxation when the shock-applied normal surface stress exceeds the static elastic limit. Strain relaxation data from these experiments was used with the quasi-static model developed to describe the deformation of the tube. The experimental and model strain-time profiles compared favorably. (Modified author abstract)

AD-780 759/7GA PC$3.75/MF$1.45
Watervliet Arsenal N Y
INTERACTION OF COPPER-CONTAINING ROTATING BAND METAL WITH GUN BORES AT THE ENVIRONMENT PRESENT IN A GUN TUBE.
Technical rept.,
R. S. Montgomery. Jun 74, 59p Rept no. WVT-TR-74016

Descriptors: *Copper, *Rotating bands, *Nickel alloys, *Erosion, *Gun barrels, Cobalt alloys, Bullets(Projectiles), Heat resistant alloys, Automatic weapons, Steel, Molybdenum alloys, Aluminum alloys, Titanium alloys, Chromium alloys.
Identifiers: Steel 4340, Nickel alloy Rene 41, Nickel alloy Udimet 700, Iron alloy 2Al 13Cr 38Ni 6Mo2-1/2Ti, Pyromet X-15.

The nickel-based, cobalt-containing high temperature alloys now being considered for barrels for rapid-firing aircraft weapons could be seriously affected by interaction with copper-containing rotating band metal. Copper could interact with the bore metal at the high operating temperatures planned for the new alloy barrels with the formation of low-melting, easily-eroded surface layers. 4340 Steel, Pyromet X-15, C. G. 27, Rene 41, and Uidmet 700 were studied with sessile-drop experiments and firing experiments which simulated conditions in the bore of a rapid-firing gun. It was found that, although C. G. 27, Rene 41, and Uidmet 700 all interacted strongly with copper in sessile-drop experiments, only Rene 41 showed any interaction with copper alloy in the firing experiments. (Modified author abstract)

AD-780 777/9GA PC$3.25/MF$1.45
Naval Ship Research and Development Center Annapolis Md
AN INVESTIGATION OF THE PLASTIC FRACTURE OF HIGH-STRENGTH STEELS.
T. B. Cox. Jun 74, 49p Rept no. NSRDC-4296

Descriptors: *Steel, *Fracture(Mechanics), Impurities, Defects(Materials), Crack propagation, Carbides, Nitrides, Sulfides.
Identifiers: Steel 4340, Maraging steel 18Ni, Manganese sulfides, Titanium carbonitrides, Inclusions.

The mechanisms of plastic fracture (dimpled rupture) in high-purity and commercial 18 Ni, 200 grade maraging steels and quenched and tempered AISI 4340 steels have been studied. Plastic fracture takes place in the maraging alloys through void initiation by fracture of titanium carbonitride inclusions and the growth of these voids until impingement results in coalescence and final fracture. The fracture of AISI 4340 steel occurs by nucleation and subsequent growth of voids formed by fracture of the interface between manganese sulfide inclusions and the matrix. The sizes of nonmetallic inclusions are an important aspect of the fracture resistance of these alloys, since void nucleation occurs more readily at the larger inclusions and that void growth also proceeds more rapidly from the larger inclusions. (Modified author abstract)

AD-780 795/1GA PC$3.25/MF$1.45
Army Tank-Automotive Command Warren Mich
ANOMALIES OF HEAT TREATMENT TO CARBURIZED STEELS.
Technical rept.,
John Vettraino, and Daniel Burrows. May 74, 29p Rept no. TACOM-TR-11866

Descriptors: *Steel, *Gears, Fatigue(Mechanics), Wear, Tanks(Combat vehicles), Heat treatment, Microstructure, Case hardening.
Identifiers: *Carburizing.

Three steels which are commonly used in tank-automotive gears were carburized to produce three different case microstructures. Tests simulating actual wear and fatigue on gear teeth under high contact loads were made using carburized rollers. A comparison of all test data was compiled and evaluated. (Author)

AD-780 799/3GA PC$3.00/MF$1.45
Army Materials and Mechanics Research Center Watertown Mass
INVESTIGATION OF MICROQUENCHED MAGNESIUM ZK60A ALLOY.
Final rept.,
Saul Isserow. Apr 74, 20p Rept no. AMMRC-TR-74-7

Descriptors: *Magnesium alloys, *Powder metallurgy, Quenching, Fabrication, Zinc alloys, Zirconium alloys, Impact tests, Tensile properties, Fracture(Mechanics), Grain size.

The substantial improvement of tensile behavior and impact resistance of magnesium ZK60A alloy by microquenching was confirmed. Metallo-

graphic examination showed that much of the strengthening, observed to approach 20 ksi, is attributable to the unusually fine grain size in rods extruded from microquenched powder. The powder itself is not unusually fine-grained but seems to embody features that make the consolidated material highly responsive to cold working, recrystallization, and aging. The grain size of the consolidated rods can, with a reasonable value for the Hall-Petch constant, be shown to account for the strength increment relative to ordinary commercial material obtained by casting and working. The powder-derived material also contains a fine intermetallic precipitate. The powder-derived material showed a fracture mode in both tension and impact tests that strongly involves separation or debonding of parallel strands. This fracture occurs in steps, is slower than the ordinary shear fracture, and absorbs much more energy. (Modified author abstract)

AD-780 801/7GA PC$3.75/MF$1.45
Army Construction Engineering Research Lab Champaign Ill
A NEW LOOK AT STRUCTURAL ENERGY DISSIPATION.
Final rept.,
F. B. Plummer, Jr. May 74, 63p Rept no. CERL-TM-M-82

Descriptors: *Dynamic loads, *Steel, Energy, Dissipation, FORTRAN, Computerized simulation, Stresses, Stress strain relations, Computer programs.
Identifiers: Finite element analysis, Steel A-36, *Energy dissipation.

The investigation is the first step of a continuing study on energy dissipation in large, dynamically loaded structures. Work is directed at qualitatively and quantitatively defining the dissipative properties of complex structural systems, with a view toward improving the considerations of energy dissipation and nonlinear response in the seismic analysis and design of buildings. The present study deals with the extension of finite element methods to provide an analytical means for determining energy dissipation caused by cyclic plasticity in cyclically loaded structures. A computer-based cyclic stress-strain simulation model is developed which serves as the basis for the finite element constitutive relation. The model's behavior incorporates hysteretic material behavior and load history effects. It is experimentally verified for A-36 steel. (Modified author abstract)

AD-780 802/5GA PC$3.75/MF$1.45
Army Construction Engineering Research Lab Champaign Ill
CYCLIC MECHANICAL TESTS AND AN APPROPRIATE ANALYTICAL STRESS-STRAIN MODEL FOR A36 STEEL.
Final rept.,
J. F. Martin. May 74, 61p Rept no. CERL-TR-M-86

Descriptors: *Steel, *Stress strain relations, Cycles, Computer programs, Test methods.
Identifiers: Finite element analysis, Steel A-36.

The report establishes the monotonic and steady-state cyclic stress-strain properties for smooth, uniaxially-loaded specimens of A36 steel. Transient characteristics of cyclic hardening and softening and cyclic relaxation of mean stress are investigated. Deflection versus load and strain versus load are reported for a simple beam subjected to three-point bending. Six computer programs are included. These programs were developed to fit specific needs of the finite element program for determining energy dissipation in dynamically loaded structures. (Author)

AD-780 820/7GA PC$3.00/MF$1.45
Army Materials and Mechanics Research Center Watertown Mass
FUNDAMENTAL CONSIDERATIONS IN THE DEVELOPMENT OF IMPROVED BERYLLIUM FOR MISSILE STRUCTURES.
Final rept.,
Lewis R. Aronin. May 74, 21p Rept no. AMMRC-MS-74-6

Descriptors: *Beryllium, *Beryllium alloys, Powder metallurgy, Deformation, Grain size, Fabrication, Mechanical properties, Guided missiles, Structures.

The paper discusses recent improvements in beryllium in terms of its basic deformation and alloying behavior. Recent advances in beryllium are attributable to three factors in addition to impurity control: (1) powder production by impact attritioning; (2) consolidation of isotropic material by hot isostatic compaction; and (3) development of plasma spraying as a consolidation technique. Properties attainable in these materials are discussed. Further evaluations of these materials under biaxial and dynamic load conditions are required. Fabrication and testing of structures under simulated load conditions are recommended. (Modified author abstract)

AD-780 911/4GA PC$3.25/MF$1.45
Rockwell International Corp Thousand Oaks Calif Science Center
DEFORMATION AND SOLID SOLUTION STRENGTHENING OF BCC TITANIUM-MOLYBDENUM ALLOYS.
Annual rept. 1 Jan-1 Jun 74,
R. G. Baggerly, N. E. Paton, and J. C. Williams. Jun 74, 40p Rept no. SC518.22AR
Contract N00014-71-C-0363
See also report dated Jan 74, AD-773 546.

Descriptors: *Titanium alloys, *Deformation, Dislocations, Molybdenum alloys, Electron microscopy, Phase transformations, Precipitation, Twinning(Crystallography), Aluminum alloys.
Identifiers: Body centered cubic lattices, Titanium alloy 12-1/2Mo.

The deformation and strengthening of bcc Ti-Mo alloys has been investigated by examining single crystals of Ti-12-1/2 wt.% Mo. A change in deformation mode from twinning to slip occurs when single phase crystals are aged to precipitate omega phase. In the single phase solution treated condition, the crystals deform by (332) <113> twinning. When omega phase is present the crystals deform by <111> slip. The occurrence and formation of alpha phase in Ti-Mo-Al alloys has also been investigated. The relationship between Burgers and non-Burgers alpha phase is discussed with regard to mechanisms of formation and kinetics of the transformation. (Author)

AD-780 915/5GA PC$3.75/MF$1.45
Terra Tek Inc Salt Lake City Utah
THE MECHANICAL RESPONSE OF A POROUS URANIUM ALLOY.
Final rept. Dec 72-Jul 73,
F. H. Shipman, J. N. Johnson, and S. J. Green. Apr 74, 55p Rept no. TR-73-36 AMMRC-CTR-74-34
Contract DAAG46-73-C-0094

Descriptors: *Uranium alloys, *Porous metals, Stress strain relations, Ultrasonic tests, Porosity, Density, Triaxial stresses.

Experimental and theoretical results are presented for the mechanical response of a porous uranium alloy subject to quasistatic uniaxial strain and hydrostatic compression. Two states of porosity were studied; one very small (about 1%) and the other somewhat larger (about 13%). Experimental techniques previously employed on geological materials are used to obtain all principal stress and strain components. Also, longitudinal elastic wave speeds obtained by ultrasonic techniques are presented as a function of initial sample density. The stress-strain behavior of this material is porosity dependent and no distinct elastic limit or crushup strength is observed. An analytical model that considers both the mean normal stress and the deviatoric stress influence on the crushup process is developed for uniaxial-strain and hydrostatic loading conditions. (Modified author abstract)

AD-780 932/0GA PC$3.75/MF$1.45
United States Steel Corp Monroeville Pa Research Lab
PRESSURE DEPENDENCE OF YIELDING AND ASSOCIATED VOLUME EXPANSION IN TEMPERED MARTENSITE.
Technical rept. 1 Oct 72-28 Feb 74,
William A. Spitzig, Robert J. Sober, and Owen Richmond. May 74, 54p Rept no. 76-H-006(064)
Contract N00014-73-C-0092

Descriptors: *Steel, *Stress strain relations, Hydrostatic pressure, Yield strength, Expansion, Tempering, Plastic deformation.
Identifiers: Steel 4310, Steel 4330.

The stress-strain behavior of quenched and tempered AISI 4310 and 4330 steels was examined in tension and compression under superimposed hydrostatic pressures up to 160 ksi (1104 Mn/sq m). The results showed that yield and flow stresses were sensitive to hydrostatic pressure, but that work hardening and the magnitude of the strength-differential (S-D) effect between compression and tension were relatively intensitive. Measurements of the volume changes occurring during plastic deformation at atmospheric pressure showed that the plastic volume expansion was larger than that measured in materials which show a smaller S-D effect. They also showed, however, that the plastic volume change was a small portion of the total volume expansion during plastic deformation. The observations on pressure dependence of yielding were used to derive a specific yield condition for these steels, and the observations on volume expansion were then used to test the normality of the plastic-strain-rate vector to this yield surface. Contrary to the widely accepted theory, the results suggest that the total strain-rate vector, rather than the plastic portion, is normal to the yield surface. (Author)

AD-781 008/8GA Not available NTIS
Defence Research Establishment Pacific Victoria (British Columbia)
RECRYSTALLIZATION TEXTURE FORMATION IN HEAVILY-DEFORMED AISI 310 STAINLESS STEEL.
B. F. Peters, and D. C. Reid. 22 Jun 73, 5p Rept no. DREP-Reprint-74-1
Availability: Pub. in Metallurgical Transactions, v4 p2851-2854 Dec 73.

Descriptors: *Stainless steel, *Annealing, *Recrystallization, Deformation, Microstructure, Electron microscopy, Canada.
Identifiers: Steel 310.

AD-781 065/8GA PC$3.25/MF$1.45
Air Force Materials Lab Wright-Patterson AFB Ohio
REVERSE LOADING EFFECTS IN BEND TESTS ON HOT ISOSTATICALLY PRESSED (HIP) BERYLLIUM.
Final rept. Nov 72-Jun 73,
T. Nicholas, and M. J. Sever. Mar 74, 31p Rept no. AFML-TR-73-258

Descriptors: *Beryllium, Bending, Stress strain relations, Loads(Forces), Hot pressing, Isostatic pressing.
Identifiers: Bend tests, Stress strain diagrams.

Results of four-point bend tests on two grades of hot isostatically pressed (HIP) beryllium are presented. Both one-directional and reversed loading were used to evaluate the effects of precompression on the subsequent tensile strain to failure. Additional tests on wide-bend specimens were used to evaluate the response of beryllium in bending under plane strain conditions. Stress-strain curves calculated from the results of bend tests in-

dicate that flow stresses are higher than those obtained from uniaxial tension tests. (Author)

AD-781 133/4GA PC$6.00/MF$1.45
Battelle Columbus Labs Ohio
RESEARCH ON METALLURGICAL SYNTHESIS.
Final rept.,
B. A. Wilcox, G. T. Hahn, and R. I. Jaffee. Jan 74, 228p* AFML-TR-73-238-Pt-2
Contract F33615-71-C-1679
See also Part 1, AD-753 910.

Descriptors: *Aluminum alloys, *Titanium alloys, *Ceramic materials, *Dispersion hardening, *Vapor plating, *Refractory materials, Mechanical properties, Microstructure, Powder alloys, Oxides, Induction heating, Boron alloys, Yttrium oxides, Creep, Fracture(Mechanics), Toughness, Crucibles, Shock waves, Thermomechanics.
Identifiers: Hafnium titanates, Aluminum alloy 6061, Aluminum alloy 7075.

The research program consists of various tasks on metallurgical synthesis, which are aimed at developing improved microstructures in metals and ceramics of interest to the Air Force. The tasks are considered 'next step' research, in that prior critical experiments have demonstrated the feasibility of a concept. The research was aimed at developing the potential usefulness of the basic concept, and to determine the circumstances under which it might be expected to operate. The tasks discussed in this report deal chiefly with research on aluminum and titanium alloys, and to a lesser extent with ceramics. (Modified author abstract)

AD-916 695/0GA PC$17.00/MF$1.45
Boeing Aerospace Co., Seattle, Wash.
CORROSION FATIGUE CRACK GROWTH IN AIRCRAFT STRUCTURAL MATERIALS.
Final technical rept. 1 Jun 71-30 Jun 73,
L. R. Hall, R. W. Finger, and W. F. Spurr. Sep 73, 278p AFML-TR-73-204
Contract F33615-71-C-1687
Distribution Limitation now Removed.

Descriptors: *Airframes, *Corrosion resistant alloys, *Steel, Airframes, *Aluminum alloys, *Titanium alloys, Stress corrosion, Cracking(Fracturing), Fracture(Mechanics), Fatigue(Mechanics), Mechanical properties, Metal plates, Cantilever beams, Crack propagation, Cracks, Grain size, Annealing, Cooling, Environmental tests, Air, Distilled water, Salt water, Jet engine fuels, Water, Sumps, Loads(Forces).
Identifiers: *Steel 9Ni 4Co 0.3C, *Aluminum alloy 7075, *Aluminum alloy 7475, *Titanium alloy 6Al 4V, Beta titanium alloys, Overload, JP-4 fuel.

This experimental program was undertaken to obtain information on stress corrosion cracking and corrosion fatigue crack growth in high strength metal alloys suitable for airframe components. In addition, tests were conducted to evaluate the effects of overloads and metallurgical factors on corrosion fatigue crack growth. The test program involved five alloys and seven test media. The four principal alloys were: 7075-T651 aluminum, 6Al-4V(ELI) beta annealed (beta A) titanium, 6Al-4V recrystallize annealed (RA) titanium, and 9Ni-4Co-0.3C steel (220-240 KSI). (Modified author abstract)

CALT-767-P-3-34 PC$4.50/MF$1.45
California Inst. Of Tech., Pasadena (Usa). W.M. Keck Lab. Of Engineering Materials.
STUDY OF DISLOCATION MOBILITY AND DENSITY IN METALLIC CRYSTALS. FINAL REPORT.
T. Jr. Vreeland, and S. S. Lau. 1 Feb 74, 28p
Contract AT(04-3)-767

Descriptors: (*Metals, *Dislocations), (*Copper, Dislocations), (*Lead, Dislocations), (*Zinc, Dislocations), Aluminium, Bcc lattices, Crystals, Deformation, Edge dislocations, Iron, Iron alloys, Irradiation, Neutrons, Physical radiation effects, Radiation chemistry, Screw dislocations, Silicon alloys.

For abstract, see NSA 30 01, number 02319.

CEA-CONF-2520 PC$3.00/MF$1.45
Centre National de la Recherche Scientifique. 92 - Meudon-Bellevue (France). Lab. De Physique des Materiaux.
PROBLEMS POSED BY THE PREPARATION OF HOMOGENEOUS LAYERS OF IRON--SILVER ALLOY BY COPULVERIZATION.
C. Sella, L. Tertian, P. Regnier, and A. Le Bian. 1973, 6p CONF-731061-1
In French.

Descriptors: (*Iron alloys, *Powder metallurgy), (*Silver alloys, Powder metallurgy), Foils, Grain size, Layers, Powders.

For abstract, see NSA 30 01, number 02320.

COO-2172-3 PC$3.00/MF$1.45
Cornell Univ., Ithaca, N.Y. (Usa). Dept. Of Materials Science and Engineering.
GRAIN BOUNDARY SLIDING AND STRUCTURE. PROGRESS REPORT, DECEMBER 1, 1972--NOVEMBER 30, 1973.
C. Y. Li. 1 Sep 73, 14p
Contract AT(11-1)-2172

Descriptors: (*Lead, *Deformation), (*Aluminium alloys, Deformation), (*Niobium, *Strain hardening), (*Stainless steel-316, Strain hardening), Crystal structure, Grain boundaries, Mechanical properties, Monocrystals, Plasticity, Polycrystals.

For abstract, see NSA 30 01, number 02323.

COO-3166-6 PC$4.75/MF$1.45
Cornell Univ., Ithaca, N.Y. (Usa). Dept. Of Materials Science and Engineering.
HYDROGEN BRITTLENESS IN HYDROGEN AND HYDROGEN--OXYGEN GAS MIXTURES.
H. H. Johnson. 31p CONF-730605-3
Contract AT(11-1)-3166

Descriptors: (*Steels, *Cracks), (*Hydrogen, *Corrosive effects), (*Oxygen, Corrosive effects), Brittleness, Environments, Growth, Hydrides, Mechanical properties, Stresses, Temperature dependence, Tensile properties, Yield strength.

For abstract, see NSA 30 01, number 02326.

COO-3407-8 PC$4.25/MF$1.45
Pennsylvania Univ., Philadelphia (Usa). Dept. Of Metallurgy and Material Science.
DISLOCATION MOBILITIES IN ORDERED ALLOYS. ANNUAL PROGRESS REPORT.
D. P. Pope. 26 Mar 74, 21p
Contract AT(11-1)-3407

Descriptors: (*Copper alloys, *Dislocations), (*Gold alloys, Dislocations), Crystal structure, Dislocation pinning, Low temperature, Medium temperature, Microstructure, Order parameters, Shear properties, Slip, Strain hardening, Velocity.

For abstract, see NSA 30 01, number 02327.

FRNC-R-34 PC$4.00/MF$1.45
Electricite de France, 77 - Ecuelles. Dept. Etudes des Materiaux.
CAUSTIC CORROSION TESTS ON STEEL (10CD 9-10) TUBES FOR THE STEAM GENERATORS OF SODIUM COOLED FAST REACTORS. EXAMINATION OF 3B AND 13B TEST PIECES.
A. Lecante. 17 Nov 72, 10p
In French.

Descriptors: (*Steels, *Corrosion), (*Chromium-molybdenum steels, Corrosion), (*Sodium, *Corrosive effects), (*Steam, Corrosive effects), Cracks, High temperature, Steam generators, Tubes, Water.

For abstract, see NSA 30 01, number 00836.

IS-T-629 PC$6.75/MF$1.45
Ames Lab., Iowa (Usa).
BONDING AND PHASE TRANSITION IN (Ti,V)S SOLID SOLUTIONS.
D. H. Leebrick. Mar 74, 75p
Contract W-7405-eng-82

Descriptors: (*Titanium sulfides, *Phase transformations), (*Vanadium sulfides, Phase transformations), Band theory, Chemical bonds, Chemical composition, Density, Electronic structure, Group theory, Lattice parameters, Solid solutions, Valence.

For abstract, see NSA 30 01, number 02281.

LA-UR-74-273 PC$3.50/MF$1.45
Los Alamos Scientific Lab., N.Mex. (Usa).
RESPONSE OF IRON TO DYNAMIC COMPRESSION.
J. E. Hockett, and E. G. Zukas. 1973, 29p CONF-740413-1

Descriptors: (*Iron, *Compression), Deformation, Heat treatments, High temperature, Low temperature, Medium temperature, Metallography, Strains, Stress analysis, Twinning.

For abstract, see NSA 30 01, number 02334.

LBL-2547 PC$5.50/MF$1.45
California Univ., Berkeley (Usa). Lawrence Berkeley Lab.
STEADY STATE CREEP IN PB--SN EUTECTIC ALLOYS.
D. I. Grivas. Jan 74, 47p
Contract W-7405-eng-48

Descriptors: (*Lead alloys, *Deformation), (*Tin alloys, Deformation), Creep, Equations, Grain size, Performance testing, Stresses.

For abstract, see NSA 30 01, number 02335.

N74-22200/1GA PC$13.25/MF$1.45
Carnegie-Mellon Univ., Pittsburgh, Pa. Dept. of Metallurgy and Materials Science.
AN INVESTIGATION OF THE PLASTIC FRACTURE OF HIGH STRENGTH STEELS.
Ph.D. Thesis.
T. B. Cox, and J. R. Low, Jr.. Mar 73, 202p NASA-CR-138162, TR-5
Contract NGR-39-087-003

Descriptors: *Fracture mechanics, *High strength steels, *Plastic deformation, Crack propagation, Fractography, Microstructure, Tensile properties, Voids.

For abstract, see STAR 1213

N74-22537/6GA PC$4.75/MF$1.45
Israel Inst. of Tech., Haifa. Dept. of Aeronautical Engineering.
NOTCH SENSITIVITY AND FATIGUE STRENGTH OF AIRCRAFT SHEET MATERIAL SPECIMENS.
A. Buch. 1974, 35p TAE-184

Descriptors: *Airframe materials, *Aluminum alloys, *Fatigue tests, *Notch sensitivity, Fracture mechanics, Metal fatigue, Metal sheets, Notch strength, Tensile tests.

For abstract, see STAR 1213

N74-22539/2GA PC$5.75/MF$1.45
Technion - Israel Inst. of Tech., Haifa. Dept. of Aeronautical Engineering.
FATIGUE DAMAGE CUMULATION FOR ROUND STEEL SPECIMENS WITH TRANSVERSE HOLES (K SUB T EQUALS 2) IN COMPARISON WITH DAMAGE CUMULATION FOR OTHER SPECIMEN TYPES.
A. Buch, and F. Weinstein. Oct 72, 52p TAE-164

Descriptors: *Carbon steels, *Fatigue tests, *Hole distribution (Mechanics), Bending, Loading moments, Stress cycles.

For abstract, see STAR 1213

ORNL-TM-4541 PC$4.50/MF$1.45
Oak Ridge National Lab., Tenn. (Usa).
EFFECT OF HIGH HELIUM CONTENT ON STAINLESS STEEL SWELLING.
F. W. Wiffen, and E. E. Bloom. May 74, 26p
Contract W-7405-eng-26

Descriptors: (*Stainless steel-316, *Physical radiation effects), Helium, Hfir reactor, Neutron beams, Swelling, Temperature dependence.

For abstract, see NSA 30 01, number 00937.

ORNL-4956 PC$5.45/MF$1.45
Oak Ridge National Lab., Tenn. (Usa).
PREPARATION, TESTING, AND ANALYSIS OF ZINC DIFFUSION SAMPLES, NASA SKYLAB EXPERIMENT M-558.
D. N. Braski, E. H. Kobisk, and F. R. O'Donnell. Apr 74, 60p
Contract W-7405-eng-26

Descriptors: (*Zinc, *Self-diffusion), Liquid metals, Tracer techniques.

For abstract, see NSA 30 01, number 02360.

ORO-3808-28 PC$5.50/MF$1.45
Virginia Univ., Charlottesville (Usa). Dept. Of Physics.
DYNAMIC DISLOCATION PHENOMENA IN SINGLE CRYSTALS OF METALS AND ALLOYS. FINAL REPORT.
J. W. Mitchell. 1973, 46p
Contract AT(40-1)-3808

Descriptors: (*Copper alloys, *Crystal growth), (*Aluminium alloys, Crystal growth), (*Nickel alloys, *Mechanical properties), Edge dislocations, Elasticity, Monocrystals, Plasticity, Research programs, Stresses, Ultrasonic testing, Velocity.

For abstract, see NSA 30 01, number 02363.

PATENT-3 793 014 Not available NTIS
Department of the Air Force Washington D C
PROCESS FOR FABRICATING POROUS BERYLLIUM BILLETS.
Patent,
Stuart N. Rosenwasser. Filed 15 Mar 73, patented 19 Feb 74, 4p Rept nos. PAT-APPL-341 634,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Beryllium, *Isostatic pressing, *Patents, Billets(Materials), Porous metals, Fabrication, Powder metallurgy, Sintering, Vacuum.
Identifiers: PAT-CL-75-221.

The patent describes porous beryllium billets prepared by cold isostatic pressing of a mold containing beryllium powder, and sintering under a vacuum the resulting beryllium billet. The billets so produced are particularly useful as a matrix material for active transpiration systems.

PB-233 047/8GA PC$9.25/MF$1.45
Foster Wheeler Corp., Livingston, N.J.
STUDY OF THE APPLICATION OF ALUMINUM AS A PRINCIPAL MATERIAL OF CONSTRUCTION IN A 50 MGD MULTISTAGE FLASH DISTILLATION SYSTEM.
Final rept.,
J. W. O'Meara, W. F. Savage, and R. H. Evans. May 74, 124p Int-OSW-RDPR-74-941
Contract DI-14-01-0001-1144

Descriptors: *Desalting, *Construction materials, *Aluminum, Heat transfer, Distillation equipment, Industrial plants, Cost estimates, Aluminum alloys, Capitalized costs, Materials replacement, Corrosion prevention, Flow charts, Engineering drawings, Design, Evaporators, Fabrication.
Identifiers: *Multistage flash distillation.

The report represents an engineering study for the application of aluminum as a principal material of construction in a 50 MGD multistage flash distillation system. It includes such topics as industrial experience with aluminum, necessary design modifications, thermal performance, fabrication problems, maintenance and replacement, capital cost estimates, and corrosion protection.

RT/CHI-(73)7 PC$4.75/MF$1.45
Comitato Nazionale Per l'Energia Nucleare, Rome (Italy).
EVALUATION OF THE SUSCEPTIBILITY OF DIFFERENT STEELS TO CREVICE CORROSION.
A. Borello, and A. Conte. 29 Aug 73, 34p

Descriptors: (*Stainless steel-304, *Corrosion), (*Stainless steel-316, Corrosion), (*Stainless steel-321, Corrosion), (*Stainless steel-17-4ph, Corrosion), Cavities, Cirene reactor, Reactor charging machines, Stainless steels.

For abstract, see NSA 30 01, number 00837.

SLA-73-1099 PC$3.50/MF$1.45
Sandia Labs., Albuquerque, N.Mex. (Usa).
QUANTITATIVE ANALYSIS OF THE INFLUENCE OF CONTAMINANTS ON THERMOCOMPRESSION BONDING OF GOLD.
P. H. Holloway. Mar 74, 27p
Contract AT(29-1)-789

Descriptors: (*Gold, *Bonding), Auger electron spectroscopy, Chromium oxides, Compression, Contamination, Films, Hydrocarbons, Lead, Microelectronic circuits, Oxides, Quantitative chemical analysis, Residues.

For abstract, see NSA 30 01, number 02288.

SLA-73-498 PC$4.00/MF$1.45
Sandia Labs., Albuquerque, N.Mex. (Usa).
PRELIMINARY FRACTURE TOUGHNESS SURVEY OF HIGH STRENGTH STEEL SHEET.
J. P. Jr. Hickerson. Apr 74, 19p
Contract AT(29-1)-789

Descriptors: (*Steels, *Fracture properties), (*Nickel steels, Fracture properties), (*Chromium steels, Fracture properties), (*Cobalt alloys, Fracture properties), Molybdenum alloys, Sheets.

For abstract, see NSA 30 01, number 00870.

SLA-73-5810 PC$3.00/MF$1.45
Sandia Labs., Albuquerque, N.Mex. (Usa).
HYDROGEN IN METALS: A NEW THEORETICAL MODEL.
A. C. Switendick. 1973, 12p CONF-740306-4

Descriptors: (*Hydrogen, *Electronic structure), (*Energy storage, *Hydrides), Crystal models, Density, Energy levels, Solubility, Storage.

For abstract, see NSA 30 01, number 02368.

SLL-73-5021 PC$4.00/MF$1.45
Sandia Labs., Livermore, Calif. (Usa).
USING CRACK-MOUTH DISPLACEMENT FOR MEASUREMENT AND CONTROL DURING FRACTURE TESTS.
T. C. Mamaros, and A. T. Jones. Apr 74, 20p
Contract AT(29-1)-789

Descriptors: (*Fracture properties, *Measuring methods), (*Uranium base alloys, Fracture properties), (*Niobium alloys, Fracture properties), Cracks, Testing.

For abstract, see NSA 30 01, number 00871.

SU-326-P-17-X-5 PC$7.25/MF$1.45
Stanford Univ., Calif. (Usa). Dept. Of Materials Science and Engineering.
STRUCTURE DEPENDENCE OF HIGH TEMPERATURE DEFORMATION OF METALS. PROGRESS REPORT, DECEMBER 1, 1972--DECEMBER 1, 1973.
W. D. Nix, and C. R. Barrett. 1 Jan 74, 85p
Contract AT(04-3)-326

Descriptors: (*Chromium, *Deposition), (*Lead alloys, *Plasticity), (*Tin alloys, Plasticity), (*Aluminium, Plasticity), Control, Creep, Crystal structure, Deformation, Ductility, Grain size, High temperature, Magnesium, Research programs, Zinc.

For abstract, see NSA 30 01, number 02374.

UCLA-34-P-172-11 PC$5.50/MF$1.45
California Univ., Los Angeles (Usa). School of Engineering and Applied Science.
PARTICLE SIZE DISTRIBUTION EFFECTS IN PRECIPITATION HARDENING. FIFTH ANNUAL PROGRESS REPORT, 1 JANUARY 1973--15 JANUARY 1974.
A. J. Ardell. Feb 74, 49p
Contract AT(04-3)-34

Descriptors: (*Nickel base alloys, *Physical radiation effects), (*Aluminium alloys, Physical radiation effects), (*Electron microscopy, *Sample preparation), (*Nimonic pe16, Physical radiation effects), Aging, Monocrystals, Particle size, Precipitation hardening, Shear, Stresses.

For abstract, see NSA 30 01, number 00938.

UCLA-34-P-201-9 PC$4.75/MF$1.45
California Univ., Los Angeles (Usa). School of Engineering and Applied Science.
BRAGG--WILLIAMS AND OTHER MODELS OF THE OMEGA PHASE TRANSFORMATION.
D. de Fontaine, and R. Kikuchi. Dec 73, 33p
Contract AT(04-3)-34

Descriptors: (*Titanium alloys, *Phase transformations), (*Zirconium alloys, Phase transformations), (*Hafnium alloys, Phase transformations).

For abstract, see NSA 30 01, number 00872.

UCRL-75278 PC$4.00/MF$1.45
California Univ., Livermore (Usa). Lawrence Livermore Lab.
LOW TEMPERATURE THERMOPHYSICAL AND MECHANICAL PROPERTIES OF HIGH PURITY PLATINUM-25 W/O IRIDIUM ALLOY.
R. J. Foley, and F. J. Jelinek. 28 Feb 74, 8p CONF-740509-3

Descriptors: (*Platinum base alloys, *Mechanical properties), (*Iridium alloys, Mechanical properties), Aging, Cold working, Impurities, Physical properties, Sample preparation, Thermal conductivity, Thermodynamic properties.

For abstract, see NSA 30 01, number 02378.

UCRL-75630 PC$4.00/MF$1.45
California Univ., Livermore (Usa). Lawrence Livermore Lab.

INFLUENCE OF THERMOMECHANICAL TREATMENT ON THE TENSILE PROPERTIES OF A PLATINUM--25 WT% IRIDIUM ALLOY.
R. J. Foley, G. S. Root, J. R. Hauber, D. P. Moak, and W. H. Pfeifer. 24 Apr 74, 18p

Descriptors: (*Platinum base alloys, *Tensile properties), (*Iridium alloys, Tensile properties), Chemical analysis, Hardness, Heat treatments, Metallography, Strain hardening, Synthesis, Yield strength.

For abstract, see NSA 30 01, number 02379.

USC-113-P-26-X-1 PC$4.00/MF$1.45
University of Southern California, Los Angeles (Usa). Electronic Sciences Lab.
GRAIN BOUNDARY SLIDING DURING HIGH-TEMPERATURE CREEP.
T. G. Langdon. Feb 74, 14p
Contract AT(04-3)-113

Descriptors: (*Creep, *Grain boundaries), (*Magnesium base alloys, Grain boundaries), (*Aluminium additions, Grain boundaries), Activation energy, High temperature, Research programs, Stacking faults.

For abstract, see NSA 30 01, number 00873.

11G. Miscellaneous Materials

N74-22409/8GA PC$3.25/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
BASIC PERFORMANCE OF A MULTILAYER INSULATION SYSTEM CONTAINING 20 TO 160 LAYERS.
R. J. Stochl. Apr 74, 28p NASA-TN-D-7659, E-7815

Descriptors: *Multilayer insulation, *Mylar (Trademark), *Thermodynamic properties, Heat sinks, Heat transfer, High temperature tests, Liquid hydrogen.

For abstract, see STAR 1213

11H. Oils, Lubricants, and Hydraulic Fluids

AD-780 716/7GA PC$4.00/MF$1.45
Naval Air Propulsion Test Center Trenton N J
EVALUATION OF MIL-L-23699 LUBRICANT PERFORMANCE IN THE T58 ENGINE.
Final rept.,
Frank Feinberg. Jun 74, 15p Rept no. NAPTC-PE-41

Descriptors: *Lubricating oils, *Gas turbines, Helicopter engines.
Identifiers: T-58 engines, Performance evaluation.

An evaluation was made of the service performance characteristics of MIL-L-23699 oils in these engines. Operational experience and problems as well as the condition of the lubricant wetted engine components at overhaul are discussed. Recommendations are made concerning the expected life of MIL-L-23699 oils in these engines. (Author)

AD-780 818/1GA PC$3.00/MF$1.45
Coating and Chemical Lab Aberdeen Proving Ground Md
BRAKE FLUID VAPOR LOCK TEMPERATURES VS EQUILIBRIUM REFLUX BOILING POINTS.
Final rept.,
Charles B. Jordan, and Robert G. Jamison. May 74, 16p Rept no. CCL-3017

Descriptors: *Brake fluids, Performance(Engineering), Boiling point, Vapor lock, Temperature, Specifications.
Identifiers: Performance evaluation.

Vapor lock temperatures (VLT) were determined on dry and humidified samples of all brake fluids listed on the Qualified Products List of Federal Specification VV-B-680, Brake Fluid Automotive, and compared to the equilibrium reflux boiling points (ERBP) of dry and humidified samples of the fluids. The VLT and ERBP of experimental brake fluids, including the new silicone fluids, were also compared. In general the dry VLT's were as much as 34F. lower than the dry ERBP's while the wet or humidified VLT's were within plus or minus 5F. of the wet ERBP's. Therefore, VLT requirements would provide a greater margin of safety than ERBP requirements. Repeatability was found to be plus or minus 2F. It is recommended that safety factors governing brake fluid performance be based on vapor lock temperatures rather than equilibrium reflux boiling points and that this recommendation be reflected in all brake fluid specifications. (Author)

N74-22141/7GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
EFFECT OF STRAIN HARDENING ON FRICTION BEHAVIOR OF IRON LUBRICATED WITH BENZYL STRUCTURES.
D. H. Buckley, and W. A. Brainard. May 74, 17p NASA-TN-D-7661, E-7842

Descriptors: *Benzene, *Iron, *Sliding friction, *Strain hardening, Aluminum, Coefficient of friction, Copper, Dry friction, Lubricants.

For abstract, see STAR 1213

11I. Plastics

AD-780 811/6GA PC$3.75/MF$1.45
Army Natick Labs Mass
RESPONSE OF POLYMERS TO TENSILE IMPACT. 2. EXTENSION OF THE INTEGRAL-EQUATION, SUCCESSIVE-SUBSTITUTION SOLUTION TO NON-LINEAR, TIME-INDEPENDENT MATERIALS.
Technical rept.,
Prescott D. Crout, Malcolm N. Pilsworth, Jr., and Harold J. Hoge. Feb 74, 87p Rept no. USA-NLABS-TR-74-26-PR
See also AD-682 811.

Descriptors: *Stress strain relations, *Elastic waves, *Tensile properties, *Polymers, Strain(Mechanics), Integral equations, Elastic properties, Materials, Nylon, Yarns, Nonlinear systems, Oscillation, Wave propagation, Partial differential equations, Numerical analysis.

An integral-equation, successive-substitution solution for the propagation of strain waves in a linear elastic material, developed in an earlier paper, is here extended to non-linear materials without creep (time-independent materials). A previously-published problem, based on experimental data for nylon string, is solved by the successive-substitution method and compared with the earlier solution obtained by the method of characteristics. In the region where the stress-strain curve of the nylon is concave upward, a tendency to oscillation builds up and the solution eventually oscillates. Oscillations in the strained portion of a string are examined theoretically and it is shown that the energy of standing waves can be used to obtain energy conservation. Although the successive-substitution method generates oscillations when it has to deal with a discontinuity in strain, the possibility that oscillations also actually exist as a means of conserving energy cannot be rules out. (Modified author abstract)

BDX-613-1103(Rev.) PC$4.00/MF$1.45
Bendix Corp., Kansas City, Mo. (Usa).
PREDICTING COMPRESSIVE STRENGTH OF URETHANE FOAMS AT HIGH STRAINS. FINAL REPORT.
T. E. Neet. May 74, 17p
Contract AT(29-1)-613

Descriptors: (*Urethane, *Compression strength), Density, Equations, Low temperature, Medium temperature, Strains.

For abstract, see NSA 30 01, number 02317.

N74-22529/3GA PC$4.25/MF$1.45
Princeton Univ., N.J. Dept. of Chemical Engineering.
ADVANCE DEVELOPMENT OF A TECHNIQUE FOR CHARACTERIZING THE THERMOMECHANICAL PROPERTIES OF THERMALLY STABLE POLYMERS.
Final Report.
J. K. Gillham, S. J. Stadnicki, and Y. Hazony. Jan 74, 24p NASA-CR-138123
Contract NGR-31-001-200
Subm-Submitted for Publication.

Descriptors: *Data systems, *Polymer physics, *Thermodynamics, *Torsional stress, Acrylic resins, Computer techniques, Damping, Materials tests, Methyl compounds, Spectrometers.

For abstract, see STAR 1213

PATENT-3 225 012 Not available NTIS
Department of Agriculture, Washington, D.C.
CARBOHYDRATE DERVIED POLYAMIDES.
Patent, *Filed 20 Sep 62, patented 21 Dec 65, William A. P. Black, Eric T. Dewar, and David Rutherford. 21 Dec 65, 7p PAT-APPL-225 168, Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Polyamide resins, *Carbohydrates, Sugar alcohols, Condensation reactions, Synthesis(Chemistry), Viscosity.
Identifiers: PAT-CL-260-78.

The invention relates to the practical preparation of nylon-type polyamides containing carbohydrate residues, which are not subject to the prior art handicaps of substantial darkening of the product during polymerization and do not develop the excessive brittleness that prevents the 'cold drawing' of fibers thereof. Linear high-viscosity carbohydrate polyamides are prepared by the interfacial polycondensation of a substituted diaminodideoxy sugar alcohol derived from hexose sugar alcohols and a dibasic acid chloride, or by a similar polycondensation of a substituted sugar dicarboxylic acid chloride, with either any ordinary diamine, or with one of the substituted diaminodideoxy sugar alcohols.

11J. Rubbers

PATENT-3 480 572 Not available NTIS
Department of Agriculture, Washington, D.C.
STARCH RESIN REINFORCED RUBBERS.
Patent, *Filed 31 Jan 68, patented 25 Nov 69, Russell A. Buchanan, and Charles R. Russell. 25 Nov 69, 2p PAT-APPL-701 843, Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Starches, *Synthetic elastomers, *Polyhydric phenols, Formidehyde, Precipitates, Vulcanized elastomers, Resorcinol, Pyrocatechols, Mechanical properties.
Identifiers: PAT-CL-260-172, Starch xanthates.

The invention relates to the discovery that the reinforcement of rubber with gelatinized starch or starch xanthate is additionally improved if the unprecipitated starch-containing rubber latex also contains certain additions of formaldehyde and polyhydroxy member selected from the group consisting of resorcinol, catechol, and pyrogallol. The starch component of the subsequently coprecipitated curds or crumbs react with the resol resin type components to become a starch-resin in-

termediate that then apparently reacts chemically with the rubber molecules under the thermal effects of the mastication and vulcanization operations.

PATENT-3 542 708 Not available NTIS
Department of Agriculture, Washington, D.C.
STARCH POLYETHYLENIMINO THIOURETHANE REINFORCED RUBBERS.
Patent,
Judith A. Douglas, and George G. Maher. Filed 13 Nov 68, patented 24 Nov 70, 3p PAT-APPL-775 526,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Synthetic elastomers, *Thiocarbamates, *Vulcanized elastomers, Tensile strength, Starches, Precipitation(Chemistry), Abrasion resistance, Copolymers.
Identifiers: *Poly(imino-ethylen), PAT-CL-260-17-4, *Starch xanthates.

The patent describes synthetic rubbers coprecipitated from latices containing added starch polyethylenimino thiourethanes, obtained by reacting low D.S. starch xanthate and polyethylenimine. This produces tan colored, easily dewatered crumbs that can be sheeted and then vulcanized with unexpected rapidity to provide highly reinforced rubber stocks that possess greatly improved strengths and abrasion resistances comparable to those obtained with conventional reinforcing agents.

PATENT-3 645 940 Not available NTIS
Department of Agriculture, Washington, D.C.
POLYSACCHARIDE-REINFORCED RUBBER.
Patent, *Filed 18 Sep 69, patented 29 Feb 72,
Howard L. Stephens, and Thomas F. Reed. 29 Feb 72, 4p PAT-APPL-859 195,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Synthetic elastomers, *Polysaccharides, *Hot working, Precipitation(Chemistry), Natural rubber, Phase transformations, Vulcanized elastomers, Elastic properties, Tensile strength, Dispersing.
Identifiers: PAT-CL-260-17-4-BB.

The invention relates to polysaccharide-rubber compositions which exhibit new and improved properties. Moist polysaccharide-rubber coprecipitates are subjected to vigorous hot mechanical working during the critical phase inversion from rubber particles in a polysaccharide matrix to polysaccharide particles in a rubber matrix. This yields masterbatches which have better dispersion of polysaccharide in rubber than has been previously attained, and which provide vulcanizates having greatly improved strengths and elastic properties.

11K. Solvents, Cleaners, and Abrasives

PB-232 943/1GA PC-GPO/MF$1.45-NTIS
Gillette Research Inst., Inc., Rockville, Md.
THE DEVELOPMENT OF PHOSPHATE-FREE HEAVY DUTY DETERGENTS.
Environmental protection technology series,
Anthony M. Schwartz, and A. Eleanor Davis. Mar 74, 254p W74-08830, EPA-600/2-74-003
Contract EPA-14-12-875
See also PB-198 222.
Paper copy available from GPO $2.65 as stock no. EP1.23:600/2-74-003.

Descriptors: *Detergents, Washing, Chemical composition, Surfactants, Performance evaluation, Biodeterioration, Toxicity, Hazards, Carbonates, Silicates, Sulfonates, Polymers, Citric acid, Ion exchange resins, Feasibility, Water softening, Succinates, Soaps, Development, Tests, Chelating agents.
Identifiers: *Phosphate free detergents, Algae growth, Acetic acid/nitrilo-tri, Acetic acid/N-acetamido-(disodium-salt)-nitrilo-di, Acetic acid/(disodium-salt)-hydroxyethyl-imino-di, Builders(Surfactants).

The purpose of this project was to demonstrate state-of-the-art possibilities for producing phosphate-free household laundry detergents of satisfactory environmental and performance characteristics. The work involved formulation of several hundred experimental detergent compositions using different surfactant-builder combinations. These were tested for laundering performance, acceptability of physical form, biodegradability, aquatic toxicity, potential hazard in use, and growth stimulation of algae. (Modified author abstract)

11L. Wood and Paper Products

PATENT-3-522-238 Not available NTIS
Department of Agriculture, Washington, D.C.
ACIDIFIED ETHYLENIMINE MODIFIED CEREAL FLOURS.
Patent,
John C. Rankin, and Charles R. Russell. Filed 11 Jan 68, patented 28 Jul 70, 3p PAT-APPL-697 032,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Flours(Food), Acidification, Cereal products, pH, Papermaking, Dispersions, Pigments, Cations, Imines.
Identifiers: PAT-CL-260-233-3, *Ethylidenimines, *Pigment retention aids.

The invention relates to low cost cationic retention aids for pigments used in the manufacture of paper. These aids which are equally effective in both soft water and hard water are produced by acidifying cereal grain flours that have been reacted with 2 to 3 weight percent of ethylenimine. The acidified aminoethylated cereal grain flour derivatives contain from about 1.2 grams to 1.8 grams of chemically bound ethylenimine constitutent per 100 grams dry basis weight of flour and a one percent aqueous dispersion of the acidified aminoethylated cereal grain flour has a pH of between about 4.0 to 5.0.

PATENT-3 542 644 Not available NTIS
Department of Agriculture, Washington, D.C.
WET STRENGTH PAPER COMPRISING STARCH CARBAMOYLETHYL ETHERS.
Patent, *Filed 9 Aug 68, patented 24 Nov 70,
Herbert E. Smith, Sherald H. Gordon, and Herbert C. Katz. 24 Nov 70, 3p PAT-APPL-751 341,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Kraft paper, *Starches, *Wet strength, Crosslinking, Mechanical properties, Tensile strength, Bursting strength, Ethers, Additives, Sodium hypochlorite.
Identifiers: PAT-CL-162-175.

The patent describes papers prepared from pulps containing 5% additions of carbamoylethyl ethers of starch or wheat flour that have then been crosslinked with sodium hypochlorite. They exhibit greatly increased wet tensile strength accompanied by less spectacular but significantly improved dry tensile and burst values.

12. MATHEMATICAL SCIENCES

12A. Mathematics and Statistics

AD-780 551/8GA PC$4.00/MF$1.45
Rome Air Development Center Griffiss AFB N Y
ERROR ELLIPSOID PROBABILITY DISTRIBUTION,
George A. Ellis. Apr 74, 80p Rept no. RADC-TR-74-107

Descriptors: *Multivariate analysis, *Probability density functions, *Impact prediction, Ellipsoids, Exponential functions, Matrices(Mathematics), Mathematical prediction, Numerical integration.
Identifiers: Eigenvalues.

The objectives of the analysis were (1) to determine the error ellipse associated with impact prediction, and (2) to determine the error ellipsoid associated with the prediction of spatial positions (q-dimensional/k-family), by specifying the dimensionality (eigenvalues) and orientation (eigenvectors) of the diagonalized error volume. A q-dimensional error ellipsoid is defined in a prediction function space and centered about the true prediction point. For each volume, there is a definite probability that a sample prediction point will be within the region. This probability is defined by integration of the density function over the error volume.

AD-780 568/2GA PC$4.00/MF$1.45
Georgia Univ Athens Dept of Statistics and Computer Science
CURVE FITTING BY THE METHOD OF MOMENTS.
Technical rept.,
Hubert Bouver. Dec 73, 90p Rept nos. TR-102, THEMIS-UGA-29
Contract N00014-69-A-0423

Descriptors: *Curve fitting, Distribution functions, Normal density functions, Weibull density functions, Computer programs, Statistical tests.
Identifiers: *Method of moments, Lognormal density functions, Pearson density functions, Gamma function, Chi square test, Goodness of fit tests.

The purpose of the report is to present a method of graduating observed frequency distribution using a computer package which is designed to aid the user in choosing among several distributions the frequency curve that will best fit his data. (Author)

AD-780 580/7GA PC$4.25/MF$1.45
North Carolina Univ Chapel Hill Dept of Statistics
ZAKAI'S CLASS OF BANDLIMITED FUNCTIONS AND PROCESSES: ITS CHARACTERIZATION AND PROPERTIES.
Interim rept.,
Stamatis Cambanis, and Elias Masry. Mar 74, 25p Rept no. Mimeo Ser-915 AFOSR-TR-74-0894
Grant AF-AFOSR-2386-72

Descriptors: *Functions(Mathematics), *Fourier transformation, *Stochastic processes, Sampling, Measure theory, Hilbert space, Theorems.
Identifiers: *Bandlimited functions, Zakai theorem.

The paper characterizes Zakai's class of bandlimited functions and processes in terms of conventionally bandlimited functions and processes. This characterization was first conjectured by Zakai and is used here to derive sharper sampling representations and to study further properties of functions and processes bandlimited in the sense of Zakai. (Author)

AD-780 590/6GA PC$4.00/MF$1.45
Florida Univ Gainesville Center for Mathematical System Theory
ALGEBRAIC GEOMETRIC DESCRIPTION OF THE CLASS OF LINEAR SYSTEMS OF CONSTANT DIMENSION.
Interim rept.,
R. E. Kalman. Mar 74, 6p AFOSR-TR-74-0825
Grant AF-AFOSR-2268-72

Descriptors: *Matrices(Mathematics), Linear systems, Geometry, Permutations, Theorems.
Identifiers: Canonical forms, Field theory(Algebra).

AD-780 591/4GA PC$4.75/MF$1.45
Purdue Univ Lafayette Ind Dept of Statistics
SOME COMPUTATIONAL PROBLEMS RELATED TO MULTINOMIAL TRIALS.
Interim rept.,
Marcel F. Neuts, and Charles C. Carson. Apr 74, 34p Rept no. Mimeo Ser-356 AFOSR-TR-74-0855
Grant AF-AFOSR-2331-72

Descriptors: *Sampling, *Probability density functions, Random variables, Set theory, Selection, Computations.
Identifiers: Ranking.

Efficient numerical algorithms are developed to evaluate several probabilities related to multinomial trials. In the first part of the paper, the probability distribution of the number of trials until the alternatives j, j=1,...,m, have occurred at least (i sub j) times is computed. The multinomial trials involve the m alternatives 1,...,m, with positive probabilities (p sub 1),...,(p sub m), of occurrence. In the second part, several aspects of a multinomial subset selection problem, discussed by S. S. Gupta and K. Nagel, are numerically investigated. (Author)

AD-780 593/0GA PC$6.00/MF$1.45
Honeywell Inc Minneapolis Minn Systems and Research Center
STUDY OF CONTROL OF PARTIAL DIFFERENTIAL EQUATION SYSTEMS WITH FLIGHT CONTROL APPLICATIONS.
Final scientific rept. 1 Mar 73-28 Feb 74,
Keith D. Graham. 28 Feb 74, 60p Rept no. F0132-FTR3 AFOSR-TR-74-0896
Contract F44620-72-C-0044
See also AD-763 823.

Descriptors: *Control theory, *Partial differential equations, *Flight control systems, Linear systems, Matrices(Mathematics), Vibration, Mathematical models, Theorems.
Identifiers: Eigenvalues, Distributed parameter systems.

The report discusses linear quadratic optimal control results for distributed parameter systems. Two systems are considered - the flexible string and the circular membrane - both with control operating only on the boundary of the physical medium. Quadratic optimal controllers for these systems are shown to depend heavily on boundary measurements made at the same point where the control is applied. The controllers effectively attenuate wave processes with nearly uniform damping of all natural vibration modes. (Author)

AD-780 617/7GA PC$3.25/MF$1.45
Technology Inc Dayton Ohio
ON THE EXACT DISTRIBUTIONS OF THE RATIOS OF THE INDIVIDUAL ROOTS TO THE TRACE OF THE COMPLEX AND REAL WISHART MATRICES.
Interim rept.,
P. R. Krishnaiah, and F. J. Schuurmann. Apr 74, 40p ARL-74-0026
Contract F33615-71-C-1463
Errata sheet inserted.

Descriptors: *Multivariate analysis, *Matrices(Mathematics), *Distribution functions, Probability density functions, Normal density functions, Tables(Data), Vibration, Signal processing, Jet transport planes.
Identifiers: *Wishart matrices, Statistical inference, Laplace transformation, C-5A aircraft, C-5 aircraft, Signal detection.

In the paper, the authors derived expressions for the densities of the ratios of the intermediate roots to the trace of the real Wishart matrix and gave percentage points of these distributions. They have also derived the distributions of the ratios of the individual roots to the trace of the complex Wishart matrix and gave percentage points of these distributions. Applications of these distributions in signal detection and other problems are also discussed. Finally, the authors illustrated the usefulness of some of the tables in analyzing the data on the vibrations of different locations of the cargo deck of a C-5A transport aircraft. (Author)

AD-780 644/1GA PC$3.25/MF$1.45
Wisconsin Univ Madison Mathematics Research Center
ALL-BIAS DESIGNS FOR SPLINE FUNCTIONS. PART I.
Technical summary rept.,
Norman R. Draper, Irwin Guttman, and Peter Lipow. May 74, 32p Rept no. MRC-TSR-1434
Contract DA-31-124-ARO(D)-462
See also Part 2, AD-780 645.

Descriptors: *Experimental design, *Splines, Analysis of variance, Polynomials, Matrices(Mathematics), Mathematical models.
Identifiers: *Spline functions.

Designs suitable for fitting first order polynomial spline models while guarding against second order biases are discussed. (Author)

AD-780 645/8GA PC$3.00/MF$1.45
Wisconsin Univ Madison Mathematics Research Center
ALL BIAS DESIGNS FOR SPLINE FUNCTIONS, PART II.
Technical summary rept.,
Norman R. Draper, Irwin Guttman, and Peter Lipow. May 74, 16p Rept no. MRC-TSR-1441
Contract DA-31-124-ARO-D-462
See also Part 1, AD-780 644.

Descriptors: *Experimental design, *Splines, Polynomials, Mathematical models.
Identifiers: *Spline functions.

The paper discusses designs suitable for fitting second order polynomial splines when it is necessary to guard against bias from third order polynomial splines. (Modified author abstract)

AD-780 647/4GA PC$3.00/MF$1.45
Wisconsin Univ Madison Mathematics Research Center
A NOTE ON THE APPLICATION OF STATIONARY STOCHASTIC PROCESSES FOR MODELING OF SPACE SERIES.
Technical summary rept.,
M. S. Phadke, and S. M. Wu. May 74, 12p Rept no. MRC-TSR-1431
Contract DA-31-124-ARO(D)-462

Descriptors: *Spectral energy distribution, *Stochastic processes, *Time series analysis, Mathematical models, Fourier transformation, White noise, Electron beam welding.
Identifiers: Stationary processes, Linear filtering.

Two sided moving average representations are necessary for describing stationary stochastic systems with space as index. The report discusses the noncanonical factorization of the spectral density function needed for such representations. (Author)

AD-780 650/8GA PC$3.00/MF$1.45
Wisconsin Univ Madison Mathematics Research Center
A PERTURBATION THEOREM FOR SUPERLINEAR BOUNDARY VALUE PROBLEMS.
Technical summary rept.,
Antonio Ambrosetti. May 74, 22p Rept no. MRC-TSR-1442
Contract DA-31-124-ARO(D)-462

Descriptors: *Nonlinear differential equations, *Boundary value problems, *Functional analysis, Perturbations, Convex sets, Hilbert space, Topology, Theorems.
Identifiers: Critical point theory.

The perturbation in critical point theory is studied. Applications are made to superlinear boundary value problems. (Author)

AD-780 651/6GA PC$3.25/MF$1.45
Wisconsin Univ Madison Mathematics Research Center
ON CUBIC SPLINE FUNCTIONS WHICH VANISH AT ALL KNOTS.
Technical summary rept.,
Carl de Boor. May 74, 31p Rept no. MRC-TSR-1424
Contract DA-31-124-ARO(D)-462

Descriptors: *Splines, *Interpolation, Convergence, Theorems.
Identifiers: *Cubic spline technique, *Spline interpolation, Existence theorems, Uniqueness theorems.

Several questions raised in the recent literature regarding the existence and uniqueness, and the global and local convergence of cubic spline interpolants are answered using an observation by G. Birkhoff concerning the exponential growth of cubic null splines. (Author)

AD-780 779/5GA PC$4.00/MF$1.45
Naval Underwater Systems Center New London Conn New London Lab
NONLINEAR MULTISTEP METHODS FOR SOLVING INITIAL VALUE PROBLEMS IN ORDINARY DIFFERENTIAL EQUATIONS.
Technical rept.,
Ding Lee. 24 May 74, 100p Rept no. NUSC-TR-4775

Descriptors: *Differential equations, *Boundary value problems, Numerical analysis, Matrices(Mathematics), Difference equations, Approximation, Stability, Theorems, FORTRAN, Computer programs.
Identifiers: *Nonlinear multistep methods, UNIVAC 1108 computers, FORTRAN 5 programming language, Stiff differential equations.

The report develops a family of Nonlinear Multistep (NLMS) numerical methods which solve initial value problems for systems of first-order differential equations. These methods are demonstrated to be a generalization of Linear Multistep (LMS) methods and are formulated to be particularly effective for equations whose solutions are asymptotically stable. The formal theory of NLMS methods with regard to stability, consistency, and convergence is fully developed and proved. NLMS methods are strongly stable and accommodate A-stability in the sense of Dahlquist. Extensive numerical test results produced by NLMS methods show important advantages over Adams' and Gear's methods and Ehle's test results. (Author)

AD-780 891/8GA PC$3.25/MF$1.45
Yale Univ New Haven Conn Becton Center
STABLE ADAPTIVE SCHEMES FOR SYSTEM IDENTIFICATION AND CONTROL.
Technical rept.,
Kumpati S. Narendra, and Prabhaker Kudva. May 74, 31p Rept no. CT-61
Contract N00014-67-A-0097-0020
Report on Control Theory.

Descriptors: *Control theory, *Adaptive systems, Signal processing, Feedback, Matrices(Mathematics), Mathematical models, Identification, Stability.

In another paper, schemes were developed for the identification and control of multivariable systems when all the state variables are accessible. In this report, the main attempt has been to remove this stringent requirement. For a single-input single-output system a unified procedure is developed for designing and adaptive observer which simultaneously estimates the state of the system as well as its parameters. These estimates can then be used

to determine suitable feed-forward and feedback controllers for the system.

AD-780 892/6GA PC$3.00/MF$1.45
Cornell Univ Ithaca N Y Dept of Operations Research
A GENERALIZED GOAL IN RESTRICTED SUBSET SELECTION THEORY.
Technical rept.,
Thomas J. Santner. May 74, 25p Rept no. TR-217
Contract N00014-67-A-0226-0014

Descriptors: *Statistical decision theory, *Sampling, Set theory, Selection, Probability, Analysis of variance.
Identifiers: Ranking.

A class of multiple decision procedures which selects a random size subset of populations not exceeding m (determined a priori) in size has previously been considered for the problem of selecting the best population among k candidates. The present paper generalizes the earlier results to the goal of selecting at least one of the t best populations. Applications of the basic theory can be made to many specific problems considered in the literature. In the regular case these include selection from univariate normal populations for means and variances, from gamma populations for scale factors and from noncentral chi square or noncentral F populations for noncentrality parameters and in the nonregular case selection from uniform populations with different supports. (Author)

AD-780 906/4GA PC$4.00/MF$1.45
Purdue Univ Lafayette Ind Dept of Statistics
SOME CONTRIBUTIONS TO FIXED SAMPLE AND SEQUENTIAL MULTIPLE DECISION (SELECTION AND RANKING) THEORY.
Technical rept.,
Deng-Yuan Huang. May 74, 78p Rept no. Mimeograph Ser-363
Contract N00014-67-A-0226-0014

Descriptors: *Statistical decision theory, *Sampling, Analysis of variance, Selection, Set theory, Probability density functions, Random variables, Entropy, Theorems.
Identifiers: Ranking.

The report makes some contributions to the subset selection procedures - both for the fixed sample and the sequential case. Chapter I deals with some subset selection procedures for binomial populations in terms of the entropy functions, which is different from the usual selection problem in terms of the success probabilities. In Chapter 2, some fixed sample optimal subset selection procedures are discussed for model I and II problems in the analysis of variance in treatments versus control, and a method for constructing some subset selection procedures is derived. Chapter 3 discusses a method for constructing some sequential subset selection procedures and some optimal sequential subset selection procedure in treatments versus control. An upper bound on the expected sample size for Bechhofer-Kiefer-Sobel sequential selection procedure with indifference zone approach is also derived. (Author)

AD-780 910/6GA PC$3.00/MF$1.45
Polytechnic Inst of New York Brooklyn Dept of Electrical Engineering and Electrophysics
CONTROL AND DYNAMIC REPAIRMAN ASSIGNMENT FOR STOCHASTIC LINEAR SYSTEMS.
Technical rept.,
Leonard Shaw, and Jason Hsuan. 1 May 74, 12p
Rept nos. PINY-EE/EP-74-013, PINY-EER-111
Contract N00014-67-A-0438-0013, Grant NSF-GK-40185

Descriptors: *Control theory, Linear systems, Dynamic programming, Stochastic processes, Failure, Maintenance.
Identifiers: Time invariant systems, *Stochastic control.

Quadratic performance is considered for systems with random jump parameters. This model represents a system with a finite number of components which fail independently, each with an exponential failure time distribution. The mean loss is to be minimized by adjusting both the feedback control and the number of repairmen available to effect repairs, one man per component, with a common exponential repair time distribution. Several kinds of performance intervals are considered: one step of random duration, a fixed number of steps, a random but finite number of steps, and an infinite duration. The number of repairmen may be changed at each failure or repair time. (Author)

AD-781 086/4GA Reprint
University of Southern California Los Angeles Dept of Electrical Engineering
ON REPRESENTING AN INTEGER AS THE HARMONIC MEAN OF INTEGERS,
Solomon W. Golomb. 1973, 6p AFOSR-TR-74-0928
Grant AF-AFOSR-1555-68
Availability: Pub. in Mathematics Magazine, v46 n5 p241-244 Nov/Dec 73.

Descriptors: *Number theory, Prime numbers, Theorems.
Identifiers: *Harmonic mean.

The paper poses and answers the question: In what ways, and in how many ways, is a positive integer the harmonic mean of two positive integers. Equivalently, given the positive integer n, what are the ordered pairs (a,b) of positive integers such that 2/n = 1/a + 1/b.

AD-781 121/9GA Reprint
Ohio State Univ Columbus
INFERENCE IN A WAITING-TIME DISTRIBUTION DERIVED FROM DEPENDENT BERNOULLI TRIALS,
Do Sun Bai, and J. S. Rustagi. Oct 73, 12p
AFOSR-TR-74-0903
Grant AF-AFOSR-2329-72
Prepared in cooperation with State Univ. Coll., Oneonta, N.Y. Revision of report dated Sep 73.
Availability: Pub. in Communications in Statistics, v3 n4 p361-371 1974.

Descriptors: *Stochastic processes, Estimates, Probability density functions.
Identifiers: Bernoulli trials, Markov processes, Maximum likelihood estimation, Parameter estimation, *Statistical inference.

The problems of unbiased estimation of parameters and test of independence are studied for the probability distribution of the number of Markov dependent Bernoulli trials required so as to obtain a preassigned number of successes. It is shown that the maximum likelihood estimate of one parameter is minimum-variance unbiased while that of the other parameter tends to overestimate the true value. For this parameter an alternative estimate is given. A test procedure for the independence of trials is also proposed. (Author)

ANL-8056 PC$4.00/MF$1.45
Argonne National Lab., Ill. (Usa).
EMPIRICAL INVESTIGATION OF REORDERING AND DATA MANAGEMENT FOR FINITE ELEMENT SYSTEMS OF EQUATIONS.
J. H. Bolstad, G. K. Leaf, A. J. Lindeman, and H. G. Kaper. Sep 73, 51p
Contract W-7405-109-eng-38

Descriptors: (*Equations, *Numerical solution), Algorithms, Finite element method, Matrices.

For abstract, see NSA 30 01, number 02228.

CEA-CONF-2109 PC$3.00/MF$1.45
Compagnie d'Etudes et de Realisations de Cybernetique Industrielle (Cerci), 75 - Paris (France).
CONTROL OF SYSTEMS REGULATED BY PARTIAL DIFFERENTIAL EQUATIONS.
M. Villeminot, and R. Zwingelstein. 9 Aug 72, 18p
CONF-7210103-1
In French.

Descriptors: Control systems, Differential equations.

For abstract, see NSA 30 01, number 02230.

ITF-73-144-P PC$4.75/MF$1.45
An Ukrainskoj SSR, Kiev. Inst. Teoreticheskoj Fiziki.
DIAGRAM TECHNIQUE FOR DEFINING THE COMPLETE CORRELATION FUNCTION.
M. F. Olekseeva, and K. D. Tovstyuk. 1973, 35p
In Russian.

Descriptors: (*Hamiltonians, *Correlation functions), Diagrams, Symmetry groups.

For abstract, see NSA 30 01, number 02264.

LA-5534-MS PC$5.45/MF$1.45
Los Alamos Scientific Lab., N.Mex. (Usa).
ALTERNATING-DIRECTION GALERKIN METHODS FOR PARABOLIC AND HYPERBOLIC PROBLEMS ON RECTANGULAR POLYGONS.
J. E. Jr. Dendy, and G. Fairweather. Mar 74, 52p
Contract W-7405-eng-36

Descriptors: Boundary conditions, Equations, Geometry.

For abstract, see NSA 30 01, number 02242.

N74-22249/8GA PC$4.75/MF$1.45
Manchester Univ. (England). Statistical Lab.
ASYMPTOTIC PROPERTIES OF SUPERCRITICAL BRANCHING PROCESSES. I: THE GALTON-WATSON PROCESS.
N. H. Bingham, and R. A. Doney. Feb 74, 33p RR-47/RAD/4

Descriptors: *Asymptotes, *Branching (Mathematics), *Random processes, Functions (Mathematics), Laplace transformation, Probability theory, Statistical distributions.

For abstract, see STAR 1213

N74-22250/6GA PC$4.00/MF$1.45
North Carolina State Univ., Raleigh. Dept. of Mathematics.
CALCULUS OF VARIATIONS AND MATHEMATICAL THEORY OF OPTIMAL CONTROL.
Final Report, 15 Sep. 1965 - 15 Mar. 1974.
H. Sagan. 15 Mar 74, 3p NASA-CR-138109
Contract NGL-34-002-032

Descriptors: *Bibliographies, *Calculus of variations, *Optimal control, Dynamic programming, Lagrange multipliers, Pontryagin principle.

For abstract, see STAR 1213

N74-22252/2GA PC$3.25/MF$1.45
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
A GENERAL FORM OF THE CO-MOVING TENSORIAL DERIVATIVE.
E. K. Huckins, Iii, and R. E. Turner. May 74, 28p
NASA-TN-D-7464, L-9136

Descriptors: *Motion, *Parameterization, *Tensor analysis, Fluid mechanics, Lagrange coordinates, Time dependence, Velocity distribution.

For abstract, see STAR 1213

N74-22253/0GA PC$4.00/MF$1.45
Manchester Univ. (England). Statistical Lab.

OPTIMAL CONTROL OF STATIONARY MARKOV PROCESSES.
R. Morton. Aug 72, 19p RR-37/RM/5

Descriptors: *Markov processes, *Optimal control, Diffusion theory, Probability density functions, Random walk.

For abstract, see STAR 1213

N74-22254/8GA PC$4.00/MF$1.45
Manchester Univ. (England). Statistical Lab.
ON THE EXISTENCE AND UNIQUENESS OF ROOTS OF MARKOV SHIFTS.
S. M. Rudolfer. Jul 73, 17p RR-43/SMR/3

Descriptors: *Analysis (Mathematics), *Markov processes, *Roots of equations, Bernoulli theorem, Conjugate points, Isomorphism.

For abstract, see STAR 1213

N74-22255/5GA PC$4.25/MF$1.45
Technion - Israel Inst. of Tech., Haifa. Dept. of Aeronautical Engineering.
A METHOD FOR UNBIASED PARAMETER ESTIMATION BY MEANS OF THE EQUATION ERROR INPUT COVARIANCE.
S. J. Merhav, and E. Gabay. Jan 74, 22p TAE-194

Descriptors: *Covariance, *Parameterization, *Vector analysis, Analog data, Linear equations, Statistical analysis.

For abstract, see STAR 1213

N74-22256/3GA PC$4.50/MF$1.45
Israel Inst. of Tech., Haifa. Dept. of Aeronautical Engineering.
UNBIASED PARAMETER ESTIMATION BY MEANS OF AUTOCORRELATION FUNCTIONS.
S. J. Merhav, and E. Gabay. Dec 73, 27p TAE-190

Descriptors: *Autocorrelation, *Linear prediction, *Parameterization, Asymptotic methods, Estimates, Information theory.

For abstract, see STAR 1213

N74-22257/1GA PC$4.00/MF$1.45
Manchester Univ. (England). Statistical Lab.
ON ERGODIC AUTOMORPHISMS OF A SOLENOID.
S. M. Rudolfer, and A. M. Wilson. Jan 74, 19p RR-45/SMR/4/AW/1

Descriptors: *Automorphisms, *Ergodic process, *Solenoids, Bernoulli theorem, Entropy.

For abstract, see STAR 1213

N74-22258/9GA PC$3.75/MF$1.45
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
AN EXTENSION OF THE LAPLACE TRANSFORM TO SCHWARTZ DISTRIBUTIONS.
D. R. Price. May 74, 65p NASA-TR-R-420, L-9234

Descriptors: *Distribution functions, *Laplace transformation, *Schwartz method, Fourier transformation, Linear transformations, Partial differential equations.

For abstract, see STAR 1213

PB-233 249/2GA PC$4.00/MF$1.45
Pacific Southwest Forest and Range Experiment Station, Berkeley, Calif.
REGRESSION SAMPLING: SOME RESULTS FOR RESOURCE MANAGERS AND RESEARCHERS.
Forest Service research note (Final),
William G. O'Regan, and Robert W. Boyd. 1974, 10p FSRN-PSW-286

Descriptors: *Natural resources management, Statistical reports, Sampling, Regression analysis, Estimating, Analysis of variance, Management information systems, Research management.
Identifiers: *Regression sampling.

Regression sampling is widely used in natural resources management and research to estimate quantities of resources per unit area. This note brings together results found in the statistical literature in the application of the sampling technique. Conditional and unconditional estimators are listed and for each estimator; exact variances and unbiased estimators for the variances are offered.

PB-233 250/0GA PC$4.00/MF$1.45
Colorado Univ., Boulder. Dept. of Computer Science.
APPROXIMATE LINEAR REALIZATIONS OF GIVEN DIMENSION VIA HO'S ALGORITHM.
Final rept.,
H. Paul Zeiger, and A. Julia McEwen. Feb 73, 20p CU-CS-012-73
Grant NSF-GJ-660

Descriptors: *Matrices(Mathematics), *Linear systems, *Approximation, Vector spaces, Algorithms.

Ho's Algorithm generates exact realizations of finite-dimensional linear systems given exact data. The authors discuss here a variant of the algorithm that generates approximate realizations of specified dimension from approximate data.

PB-233 293/0GA PC$4.00/MF$1.45
Illinois Univ., Urbana. Dept. of Computer Science.
SPERNER'S THEOREM ON MAXIMAL-SIZED ANTICHAINS AND IT'S GENERALIZATION,
C. L. Liu. Jun 74, 15p UIUCDCS-R-74-650
Grant NSF-GJ-41538

Descriptors: *Set theory, *Partitions(Mathematics), Lattices(Mathematics), Chains, Theorems.

The paper generalizes previous work by Sperner, Erdos, Kleitman, Katona, DeBruijn, Tengbergen, and Kruyswijk, and Schonheim on maximal sized antichains. Such generalization not only leads to simple proofs of known results but also sharpens some of these results.

RT/FI-(73)32 PC$8.75/MF$1.45
Comitato Nazionale Per l'Energia Nucleare, Rome (Italy).
STATISTICAL ELABORATION OF EXPERIMENTAL RESULTS. I. PRINCIPLES OF CALCULATION OF PROBABILITY.
P. R. Oliva, and F. Terrasi. 22 Aug 73, 112p
In Italian.

Descriptors: Analytical solution, Statistics.

For abstract, see NSA 30 01, number 02244.

SLA-74-198 PC$4.50/MF$1.45
Sandia Labs., Albuquerque, N.Mex. (Usa).
GLOBAL ERROR ESTIMATION FOR ORDINARY DIFFERENTIAL EQUATIONS.
L. F. Shampine, and H. A. Watts. 1974, 30p
CONF-740511-2

Descriptors: Computer codes, Differential equations, Efficiency, Errors, Reliability, Resolution.

For abstract, see NSA 30 01, number 02251.

UCID-30045 PC$5.00/MF$1.45
California Univ., Livermore (Usa). Lawrence Livermore Lab.
SOLUTION OF BANDED LINEAR SYSTEMS.
A. C. Hindmarsh. 8 May 72, 37p
Contract W-7405-eng-48

Descriptors: (*Equations, *Numerical solution), Algorithms, Computer codes, Matrices.

For abstract, see NSA 30 01, number 02259.

12B. Operations Research

AD-780 587/2GA PC$3.25/MF$1.45
Air Force Weapons Lab Kirtland AFB N Mex
LINPR: A CODE TO SOLVE LINEAR PROGRAMMING PROBLEMS AND TWO-PERSON ZERO-SUM GAMES.
Final rept. 1 Feb-1 Mar 74,
Harry F. Doyle. May 74, 32p Rept no. AFWL-TR-74-35

Descriptors: *Linear programming, *Game theory, Strategy, Computer programs, FORTRAN, Algorithms.
Identifiers: Two person games, Zero sum games, LINPR computer program.

LINPR is a FORTRAN language computer-coded simplex algorithm. The code was originally developed to solve linear programming problems and has recently been modified to also solve two-person zero-sum games. This description of the code presents the necessary details to use LINPR to solve linear programming problems and/or two-person zero-sum games. (Author)

AD-780 648/2GA PC$3.25/MF$1.45
Wisconsin Univ Madison Mathematics Research Center
ACCELERATING PROCEDURES FOR METHODS OF CONJUGATE DIRECTIONS.
Technical summary rept.,
Klaus Ritter. Apr 74, 49p Rept no. MRC-TSR-1398
Contract DA-31-124-ARO(D)-462

Descriptors: *Numerical analysis, Functions(Mathematics), Optimization, Algorithms, Convergence, Theorems.
Identifiers: *Conjugate gradient method, Unconstrained minimization.

The directions of descent generated by a method of conjugate directions are used to perform special steps which accelerate the rate of convergence of these methods. Independent of the number of variables a 2-step superlinearly convergent method can be obtained. (Modified author abstract)

AD-780 791/0GA PC$4.75/MF$1.45
Carnegie-Mellon Univ Pittsburgh Pa Management Sciences Research Group
EXPLICIT SOLUTIONS IN CONVEX GOAL PROGRAMMING.
Research rept.,
A. Charnes, W. W. Cooper, D. Klingman, and R. J. Niehaus. Jun 73, 31p Rept no. RR-341
Contract N00014-67-A-0312-0007
Prepared in cooperation with Texas Univ., Austin. Center for Cybernetic Studies Contract N00014-67-A-0126-0008.

Descriptors: *Linear programming, *Convex sets, Matrices(Mathematics).
Identifiers: *Convex programming, *Goal programming, Constraints, Duality theory.

Goal programming has now become an important tool in areas such as public management science. There is therefore a need for examining ways of securing improved computational efficiency. Based on lemmata which permit reduction of various important classes of convex goal programming models to problems of full row rank-interval programming type, explicit solutions to convex goal programming problems are exhibited. Some of the equivalences herein established are also useful in their own right and for other classes of problems--e.g., interval programming, as well as advanced start procedures and other such computational matters. (Modified author abstract)

AD-780 792/8GA PC$4.25/MF$1.45
Carnegie-Mellon Univ Pittsburgh Pa Management Sciences Research Group
MONOMIAL PROGRAMMING.
Research rept.,
T. L. Shaftel, Y. Smeers, and G. L. Thompson.
Mar 74, 22p Rept no. RR-333
Contract N00014-67-A-0314-0007

Descriptors: *Linear programming, Simplex method, Convex sets, Algorithms.
Identifiers: *Monomial programming, Constraints.

A monomial programming problem is one of minimizing a polynomial in several variables subject to monomial constraints. A log transformation changes it into a problem with non-linear objective and linear constraints which, under certain conditions can be solved by Zangwill's convex simplex method. The authors show a direct method, based on previous work, of solving the problem using a simplex-like tableau which (usually) requires less effort than the convex simplex method. (Author)

AD-780 793/6GA PC$4.00/MF$1.45
Carnegie-Mellon Univ Pittsburgh Pa Management Sciences Research Group
SOME ADVANCED START PROCEDURES FOR MANPOWER PLANNING IN GOAL PROGRAMMING MODELS.
Research rept.,
A. Charnes, W. W. Cooper, D. Klingman, and R. J. Niehaus. 30 Mar 74, 19p Rept no. RR-342
Contract N00014-67-A-0312-0007
Prepared in cooperation with Texas Univ., Austin. Center for Cybernetic Studies, Contract N00014-67-A-0126-0008, Proj. NR-047-021.

Descriptors: *Linear programming, *Manpower, *Management planning and control, Matrices(Mathematics), Computations, Mathematical models.
Identifiers: *Goal programming, Knapsack problem, Constraints.

Methods for securing advanced starts are detailed which secure basic feasible solutions without recourse to so-called Phase-One Procedures in Manpower Planning Models of Goal Programming variety. The indicated starts are obtained by access to knapsack type methods secured from the authors' recently developed methods for securing explicit solutions in convex goal programming. A significant reduction in computational time and labor is thereby secured. (Author)

AD-780 816/5GA PC$4.00/MF$1.45
Cornell Univ Ithaca N Y Dept of Operations Research
COMPLEMENTARY ORTHOGONAL SUBSPACES OF (R SUP N) AND ORIENTABILITY OF MATROIDS.
Technical rept.,
Robert G. Bland. May 74, 86p Rept no. TR-219
Contract N00014-67-A-0077-0028, Grant NSF-GP-32316

Descriptors: *Linear programming, *Network flows, Matrices(Mathematics), Vector spaces, Simplex method, Algorithms, Theorems.
Identifiers: *Matroids, Duality theory.

Fulkerson and Rockafellar have examined the elementary vectors of subspaces of (R sup n) and have proved several interesting theorems concerning complementary orthogonal subspaces of (R sup n). Some of these theorems generalize well-known results in network flow theory. The results of Fulkerson and Rockafellar are discussed, and some further properties of complementary orthogonal subspaces of (R sup n) are developed. A new class of blocking pairs of polyhedra is constructed from the elementary vectors in complementary orthogonal subspaces of (R sup n). Finally, a notion of orientability of matroids is introduced. (Modified author abstract)

AD-780 909/8GA PC$3.00/MF$1.45
Polytechnic Inst of New York Brooklyn Dept of Electrical Engineering and Electrophysics
CONTROL OF STOCHASTIC SERVICE SYSTEMS BASED ON PRESENT DELAY.
Technical rept.,
Leonard Shaw. 1 May 74, 8p Rept nos. PINY-EE/EP-74-014, PINY-EER-112
Contract N00014-67-A-0438-0013

Descriptors: *Queueing theory, *Control theory, Dynamic programming, Traffic, Maintenance, Optimization.

Optimization of two service systems is studied. Both are described by linear stochastic difference equations, with the performance interval terminating at the first passage of the state out of a specified region. The waiting time (for repair of parts or for vehicles to pass a traffic jam) is observed by a controller which decides between two possible modes of service. In one case an extra repairman can be employed, with an extra cost, to speed the emptying of the repair waiting line. In the absence of control the busy waiting line duration is a linear function of the state. In the other case, the traffic controller may divert vehicles from the road having the jam, with a corresponding penalty cost, to reduce the total delay to all drivers caught in the jam. (Modified author abstract)

AD-780 924/7GA PC$3.00/MF$1.45
Florida Univ Gainesville Dept of Industrial and Systems Engineering
MINIMUM CUTS AND RELATED PROBLEMS.
Research rept.,
Jean-Claude Picard, and H. Donald Ratliff. May 74, 22p Rept no. RR-74-6
Contract N00014-68-A-0173-0017, Grant DA-ARO-D-31-124-72-G123
Prepared in cooperation with Ecole Polytechnique, Montreal (Quebec).

Descriptors: *Integer programming, *Network flows, Set theory, Vector spaces.
Identifiers: Minimum cuts.

The paper is concerned with an integer programming characterization of a cut in a network. This characterization provides a fundamental equivalence between directed pseudosummetric networks and undirected networks. It also identifies a class of problems which can be solved as minimum cut problems on a network. (Author)

AD-780 929/6GA PC$3.25/MF$1.45
Massachusetts Inst of Tech Cambridge Operations Research Center
AN ALGORITHM FOR NONLINEAR KNAPSACK PROBLEMS.
Technical rept.,
Roy E. Marsten, and Thomas L. Morin. May 74, 30p Rept no. TR-95 AROD-9239.12-M
Contract DAHC04-73-C-0032

Descriptors: *Dynamic programming, Integer programming, Set theory, Algorithms.
Identifiers: *Knapsack problem.

A recursive algorithm for the solution of separable nonlinear multidimensional knapsack problems is developed by exploiting discontinuity preserving properties of the maximal convolution. The curse of dimensionality, which is usually associated with dynamic programming type algorithms, is successfully mitigated by reducing an M-dimensional dynamic program to a 1-dimensional dynamic program through the use of the imbedded state space approach. Computational experience with the algorithm on problems with as many as 10 state variables is also reported and several interesting extensions are discussed. (Author)

AD-780 956/9GA PC$3.00/MF$1.45
Florida Univ Gainesville Dept of Industrial and Systems Engineering
THE GENERALIZED MARKET AREA PROBLEM.
Research rept.,
Timothy J. Lowe, and Arthur P. Hurter, Jr. May 74, 25p Rept no. RR-74-4 AROD-11621.4-M
Grants DA-ARO-D-31-124-73-G149, NSF-GK-38336

Descriptors: *Market research, *Production control, Transportation, Mathematical models, Convex sets, Theorems, Theses.
Identifiers: Demand(Economics).

The paper considers the production-transportation problem of a firm with a finite number of production (supply) facilities of known location, facing demand distributed over a subset (market region) of K-dimensional Euclidean space. The demand for a single good is described by a demand density function which is continuous almost everywhere on the market region. Production cost functions exist at each production facility and transport cost functions refer to delivering the good from the production facility to the consumer. The objective is to set production at each production facility and to select a supply policy such that the total production and transportation costs are minimized. The problem is formulated in its entirety and later simplified through suboptimization. Necessary conditions for an optimal solution are derived and economic interpretations are provided. (Author)

AD-780 965/0GA PC$4.00/MF$1.45
Cornell Univ Ithaca N Y Dept of Operations Research
SEQUENCES WITH A UNIQUE REALIZATION BY SIMPLE GRAPHS.
Technical rept.,
Michael Koren. Apr 74, 19p Rept no. TR-215
Contract N00014-67-A-0077-0014

Descriptors: *Graphics, *Sequences(Mathematics), Theorems.
Identifiers: *Graph theory, Isomorphisms.

Sequences with unique realizations (up to isomorphism), by simple graphs, are characterized, partly by reduction to the case of pairs of sequences, which have a unique realization by bipartite graphs. (Author)

AD-781 113/6GA PC$3.00/MF$1.45
Cornell Univ Ithaca N Y Dept of Operations Research
ON THE UNIQUENESS OF THE SHAPLEY VALUE.
Technical rept.,
Pradeep Dubey. Jun 74, 19p
Contract N00014-67-A-0077-0014

Descriptors: *Game theory, Set theory, Permutations, Theorems.
Identifiers: *Cooperative games, *Shapley theorem, Axioms, N person games.

L. S. Shapley (Shapley, 1953) showed that there is a unique value defined on the class D of all superadditive cooperative games in characteristic function form (over a finite player - set N) which satisfies certain intuitively plausible axioms. Moreover, he raised the question whether an axiomatic foundation could be obtained for a value (not necessarily the Shapley value) in the context of the subclass C (respectively C prime, C double prime) of simple (respectively simple monotonic, simple superadditive) games alone. The paper shows that it is possible to do this. (Modified author abstract)

LA-DC-72-745 PC$4.75/MF$1.45
Los Alamos Scientific Lab., N.Mex. (Usa).
RANDOM PACKING OF EQUAL AND UNEQUAL SPHERES IN TWO AND THREE DIMENSIONS.
W. M. Visscher, and M. Bolsterli. Dec 73, 33p
Contract W-7405-eng-36

Descriptors: (*Spheres, *Packaging).

For abstract, see NSA 30 01, number 02397.

13. MECHANICAL, INDUSTRIAL, CIVIL, AND MARINE ENGINEERING

13A. Air Conditioning, Heating, Lighting, and Ventilating

AD-780 717/5GA PC$4.50/MF$1.45
Naval Air Development Center Warminster Pa Aero-Electronic Technology Dept
PULSED INERT GAS PLASMA MODEL.
Phase rept.,
A. P. Passamante, and G. D. Ferguson. 2 May 74, 26p Rept no. NADC-74009-20

Descriptors: *Arc lamps, Electric arcs, Plasmas(Physics), Flashes, Pulses, Rare gases, Xenon lamps, Krypton lamps, Stroboscopes, Radiance, Sources, Emission, Absorption, Coefficients, Night photography.

The report presents a spectral radiant emission model for the pulsed inert gas plasma arc lamp. The model is based on Kirchoff's law and NAVAIRDEVCEN evolved empirical data. Included in the discussion are some pertinent plasma arc parameters such as temperature, resistivity, collision frequency and their relation to arc current density. (Author)

AD-781 012/0GA PC$4.00/MF$1.45
Army Foreign Science and Technology Center Charlottesville Va
TRANSPORT AIR COOLERS WITH STANDARDIZED THERMOELECTRIC BATTERIES,
Yu. D. Nikolaev, and V. I. Peshel. 3 May 74, 6p Rept no. FSTC-HT-23-2333-72
Trans. of Kholodilnaya Tekhnika (USSR) n5 p16-18 May 71.

Descriptors: *Air conditioning equipment, *Thermoelectric cooling, Ground vehicles, Thermocouples, USSR, Translations.

The article discussed a standardized thermoelectric battery, which forms the basis of several local-action cooling units of automobiles, buses, agricultural and special machines.

COM-74 50542/1GA PC-GPO/MF$1.45-NTIS
National Bureau of Standards, Boulder, Colo. Cryogenics Div.
CRYOGENIC REFRIGERATORS - AN UPDATED SURVEY.
Technical note,
Thomas R. Strobridge. Jun 74, 17p NBS-TN-655
Paper copy available from GPO $0.30 as C13.46:655.

Descriptors: *Cryogenics, *Refrigerators, Refrigerating machinery, Weight(Mass), Volume, Efficiency, Cost analysis.
Identifiers: *Cyogenic refrigerators.

In 1969, we gave efficiency, weight, volume, and cost data for 95 cryogenic refrigerators and liquefiers excluding air separation plants. Recently, the survey was repeated. The original data and those for 49 additional refrigerators and liquefiers are presented spanning refrigeration capacities from 0.2 to 1,000,000 W and temperatures from 1.85 to 90K. Generally, there is no change in the trends exhibited by the older data except that the high temperature, low capacity new units seem to be larger, heavier and slightly less efficient than in prior years. Presumably, these effects are due to efforts to increase useful life and reliability. Costs remain the same as predicted before even though no dollar value adjustments were made.

N74-22569/9GA PC$19.75/MF$1.45
Dynatherm Corp., Cockeysville, Md.
HEAT PIPE DESIGN HANDBOOK, PART 1.
E. A. Skrabek. Aug 72, 331p NASA-CR-134264, DTM-72-3-PT-1
Contract NAS9-11927

Descriptors: *Heat pipes, *Heat transfer, *Thermodynamic properties, Equipment specifications, Temperature control, Temperature effects.

For abstract, see STAR 1213

PB-232 490/3GA
PC$20.00/MF$20.00;Foreign PC$22.50/MF$22.50
New Mexico Univ., Albuquerque. Technology Application Center.
HEAT PIPE TECHNOLOGY. A BIBLIOGRAPHY WITH ABSTRACTS.
Annual supplement.
1973, 236p* TAC-HP-73-11
See also PB-226 285.

Descriptors: *Heat exchangers, *Bibliographies, Utilization, Heat transfer, Theory, Design, Fabrication, Tests, Abstracts, Patents.
Identifiers: *Heat pipes.

The number of heat pipe publications during 1973 was double that in 1972. Emphasis shifted so that more work on applications and less on fundamentals was reported. Heat pipe applications described in articles published during the year include; heat exchangers for heating and air conditioning, electronics cooling, temperature control of spacecraft, heat transfer in thermionic and thermoelectric power generators, heat transfer in nuclear reactors, measurement of thermophysical properties, solar collectors, cooling engines, electrohydrodynamic phenomena, and vapor laser ovens.

13B. Civil Engineering

AD-780 750/6GA PC$6.75/MF$1.45
Green Associates Inc Towson Md
REGIONAL LANDFILL AND CONSTRUCTION MATERIAL NEEDS IN TERMS OF DREDGED MATERIAL CHARACTERISTICS AND AVAILABILITY. VOLUME I. MAIN TEXT.
Final rept.,
Richard Reikenis, Victor Elias, and Edwin F. Drabkowski. May 74, 280p* AEWES-CR-D-74-2-Vol-I
Contract DACW39-73-C-0141
See also Volume 2, AD-780 751. Report on Dredged Material Research Program.

Descriptors: *Solid wastes, *Waste disposal, *Earth fills, Coastal regions, Swamps, Reclamation, Construction materials, Sediments.
Identifiers: *Dredging, *Spoil, Land use, Army Corps of Engineers, Regional planning.

A survey of the regional needs for landfill and construction material indicated that such needs vary substantially due to population shifts and economic growth of specific regions. The following actions were concluded to be required to make dredged material a sought-after resource: (1) A detailed inventory of all identified future development projects with regional development maps that show anticipated long-range needs of fill materials; (2) Adoption of methodologies for selection and acceptance of sites for disposal and stockpiling of dredged material; (3) Development of techniques for placing, control, and dewatering of fine-grained hydraulic fill material to decrease time of consolidation; and, (4) Identification of the most economical application of present techniques for disposal of dredged material and, if necessary, development of new techniques. (Modified author abstract)

AD-780 753/0GA PC$5.50/MF$1.45
Army Engineer Waterways Experiment Station Vicksburg Miss
PRACTICES AND PROBLEMS IN THE CONFINEMENT OF DREDGED MATERIAL IN CORPS OF ENGINEERS PROJECTS.
Final rept. May 72-Aug 73,
William L. Murphy, and Timothy W. Zeigler. May 74, 196p* Rept no. AEWES-TR-D-74-2
Report on Dredged Material Research Program.

Descriptors: *Solid wastes, Waste disposal, Civil engineering, Sediments.
Identifiers: *Dredging, *Spoil, Dikes, Embankments, Army Corps of Engineers.

Confined dredged material disposal problems and practices were discussed with representatives of 17 Corps of Engineers (CE) District offices to obtain a data base for subsequent related research efforts and to disseminate the data to CE Districts and others. This report discusses only those disposal operations in which the dredged material is deposited within an area confined by natural or man-made barriers. The containment barrier may be an embankment or an open pit that will retain solids and pollutants and allow escape of less turbid and polluted water. The study dealt primarily with existing disposal sites for which pertinent data were available. In the past, little attention has been paid to the disposal of dredged material other than attempts to keep it out of the channel from which it was dredged. This practice is changing with the advent of concerted efforts by various agencies to define and control adverse effects of man's activities on the environment.

AD-780 755/5GA PC$5.00/MF$1.45
Texas Univ Dallas Inst for Environmental Studies
LITERATURE REVIEW ON RESEARCH STUDY FOR THE DEVELOPMENT OF DREDGED MATERIAL DISPOSAL CRITERIA.
Final rept.,
C. Fred Lee, and Russell H. Plumb, Jr. Jun 74, 170p* AEWES-CR-D-74-1
Contract DACW39-74-C-0024
See also AD-780 753. Report on Dredged Material Research Program.

Descriptors: *Solid wastes, *Waste disposal, *Water pollution, Sediments, Civil engineering, Marine biology, Test methods, Toxicity.
Identifiers: *Dredging, *Spoil, Aquatic microbiology, Criteria.

An extensive literature review was made as a part of an effort to establish relationships between the presence of various contaminants within sediments and the effects of sediment dredging and disposal on water quality and aquatic organisms. The review revealed that there is little or no evidence that a relation exists between bulk-sediment composition and pollution tendencies of dredged sediment. Use of criteria for dredged material disposal that are based on parameters normally used in evaluating environmental impact of domestic and industrial waste-waters is unrealistic because it is considered unlikely that there is a relation between environmental impact of a particular dredged sediment and a particular numerical value for any of these parameters in sediment. The use of a standard Elutriate Test to determine pollution potential of dredged material is superior to bulk analysis because the test recognizes that all chemicals in sediment are not equally available to aquatic organisms. It is concluded that dredged material disposal criteria should be based on a time-concentration-toxicity relationship for each chemical constituent, which could be developed from short-term bioassays with selected organisms. (Modified author abstract)

AD-780 756/3GA PC$3.75/MF$1.45
Army Engineer Waterways Experiment Station Vicksburg Miss
CONSTRUCTION OF MESL DEMONSTRATION ROAD AT FORT HOOD, TEXAS, MAY 1972,
Steve L. Webster. May 74, 53p Rept no. AEWES-Misc Paper-S-74-13

Descriptors: *Pavements, Construction, Field tests, Military facilities, Soil stabilization, Membranes, Polyethylene, Polypropylene, Protective coatings, Emulsions, Asphalt, Bituminous coatings, Reinforced concrete, Costs, Road building equipment, Performance(Engineering), Texas.
Identifiers: Fort Hood.

This report records the construction of a 1/2-mile membrane-enveloped soil layer (MESL) road constructed at Fort Hood, Texas, in May 1972. The road was constructed to field test MESL construction techniques and to provide a MESL road for long-term evaluation. The soil was a gravelly sandy clay with some shell. It was encapsulated using 6-mil polyethylene as the lower membrane and polypropylene fabric and SS-ih emulsified asphalt as the upper membrane. Construction of the MESL required 48 working hours and was completed in a 6-day period. Eight-foot-wide shoulders were constructed, and an asphaltic single-surface treatment was applied. The MESL road was opened to traffic in June 1972. A traffic count in July 1972 indicated an average daily usage by 1793 vehicles, of which 24.5% was truck traffic and 75.5% was passenger car traffic. (Modified author abstract)

AD-780 896/7GA PC$6.50/MF$1.45
Army Engineer Waterways Experiment Station Vicksburg Miss
DESIGN OF QUARRY-STONE COVER LAYERS FOR RUBBLE-MOUND BREAKWATERS.
Research rept.,
R. Y. Hudson. Jul 58, 68p Rept no. AEWES-RR-2-2
Errata sheet inserted. Hydraulic Laboratory Investigation.

Descriptors: *Breakwaters, Construction, Rock, Thickness, Stability, Porosity, Hydrodynamics, Water waves, Loads(Forces), Equations.
Identifiers: *Rubble mound breakwaters, *Quarry stone.

The first phase of the investigation, which dealt with the design of quarry-stone cover layers, is described. For the laboratory tests, small-scale rubble-mound breakwater sections are hand-constructed in a concrete flume 119 ft long, 5 ft wide, and 4 ft deep, and subjected to mechanically generated waves. The limit of stability of the armor units forming the protective cover layer is determined as a function of the wave dimensions, slope of exposed breakwater face, weight and specific weight of the armor units, and specific weight of the water in which the test sections are situated. Tests have also been conducted in which damage to the quarry-stone-type cover layer was determined as a function of wave height. Using the experimental data to determine the unknown functions in the derived equation, a new formula was obtained for the weight of armor units required to insure their stability when used as the cover layer of rubble-mound breakwaters. The new breakwater stability formula, and the experimental data obtained to date, provide the essential information for an improved method of designing rubble-mound breakwaters with cover layers composed of quarry stones placed pell-mell.

COM-74-11070/1GA PC$7.00/MF$1.45
Bureau of Resources and Trade Assistance, Foreign-Trade Zones Board, Washington, D. C.
HONOLULU HARBOR TERMINAL ANNEX OF FOREIGN TRADE SUBZONE 9A.
24 May 74, 78p OEA-74-3
Supersedes rept. no. EIS-HI-74-0218-D.

Descriptors: *Environmental impact statements, *Refineries, *Hawaii, Petroleum refining, Construction, Petroleum products, Pipeline transportation, Offshore structures, Air pollution, Water pollution.
Identifiers: Honolulu(Hawaii).

The report examines the environmental impact of the construction and operation of a marine transshipment facility in Honolulu Harbor.

COM-74-11071/9GA PC$18.00/MF$1.45
Bureau of Resources and Trade Assistance, Washington, D.C. Foreign-Trade Zones Board.
PROPOSED EXPANSION OF FOREIGN-TRADE SUBZONE 9A (HIRI OIL REFINERY), HONOLULU, HAWAII.
Final environmental impact statement.
24 May 74, 297p OEA-74-2
Supersedes rept. no. EIS-HI-74-0219-D.

Descriptors: *Environmental impact statements, *Refineries, *Hawaii, Petroleum refining, Construction, Petroleum products, Pipeline transportation, Air pollution, Water pollution, Offshore structures.
Identifiers: Ewa(Hawaii).

The report assessses the environmental impact of the proposed expansion of the Hawaiian Independent Refinery to a daily capacity of 125,000 barrels per day. The plant will be designed and operated to meet all applicable environmental standards and regulations.

COM-74-11072/7GA PC$19.50/MF$1.45
Department of Commerce, Washington, D.C. Office of Environmental Affairs.
INTER-AMERICAN TRADE AND CULTURAL CENTER AUTHORITY (INTERAMA), DADE COUNTY, FLORIDA.
Final environmental impact statement.
3 May 74, 328p OEA-74-1

Descriptors: *Environmental impact statements, *Florida, *Trade centers, Construction, Cultural recreation, Buildings, Economic development.
Identifiers: *Dade County(Florida).

The environmental impact statement reviews the environmental impact of the development and operation of a permanent cultural and trade center. Several Federal Agencies will take actions in support of the Center. There will be adverse, short-term environmental impacts during construction. In the long-term, there will be an improvement over existing ecological conditions on the site.

COM-74-11192/3GA PC$20.00/MF$20.00
National Technical Information Service, Springfield, Va.
SEWAGE AND ORGANIC WASTE IRRIGATION. A BIBLIOGRAPHY WITH ABSTRACTS.
Rept. for 1964-Jun 74,
Edward J. Lehmann. Jul 74, 93p* NTIS-WIN-74-055

Descriptors: *Bibliographies, *Sewage disposal, *Solid waste disposal, *Irrigation, Fertilizing, Soils, Utilization, Water reclamation, Abstracts, Agricultural wastes.
Identifiers: *Sewage irrigation.

This bibliography contains 79 selected abstracts of research reports retrieved using the NTIS on-line search system--NTISearch. Presented are all aspects of using sewage or organic form wastes for irrigation, fertilization, or ground water recharge. The areas covered include such topics as feasibility studies, water reclamation in arid regions, alleviating sludge disposal problems, and ecological effects.

COM-74-11201/2GA PC$20.00/MF$20.00
National Technical Information Service, Springfield, Va.
FLOOD CONTROL. A BIBLIOGRAPHY WITH ABSTRACTS.
Rept. for 1972-Jun 74,
Edward J. Lehmann. Jul 74, 205p* NTIS-WIN-74-058

Descriptors: *Flood control, *Bibliographies, Abstracts, Flood predictions, Flood zoning, Flood plains, Hydrology, River basins, Regional planning, Hazards, Management, Urban planning, Reservoirs, Mathematical models, Water pollution, Surface water runoff, Policies.

The bibliography contains 191 selected abstracts of research reports retrieved using the NTIS on-line search system-NTISearch. Presented are studies involving floods as related to control, forecasting, warning systems, urban planning, prevention, land use zoning, urbanization, and flood plain management. The reports are limited to those input to NTIS from 1972 to June 1974. Excluded are flood control studies for specific towns and reports generated by Army Engineers dealing with specific locales.

COM-74-11203/8GA PC$20.00/MF$20.00
National Technical Information Service, Springfield, Va.
ANIMAL WASTE POLLUTION AND ITS CONTROL. A BIBLIOGRAPHY WITH ABSTRACTS.
Rept. for 1964-Jun 74,
Edward J. Lehmahn. Jul 74, 129p* NTIS-WIN-74-060

Descriptors: *Water pollution control, *Industrial waste treatment, *Agricultural wastes, *Bibliographies, Livestock, Animals, Beef cattle, Dairy cattle, Farm buildings, Ecology, Surface water runoff, Fertilizers, Poultry, Food processing, Residues, Food industry.
Identifiers: *Feedlot wastes, *Manure, *Slaughtering house wastes.

The bibliography contains 115 selected abstracts of research reports retrieved using the NTIS on-line search system--NTISearch. The topics cover studies on research concerning the pollution and pollution control of animal wastes and animal processing wastes and concern research in areas such as feedlot waste pollution and control, pollution from manure used in fertilization, water runoff from farms, dairy wastes, rendering wastes, ecology aspects, poultry processing, and hoghouse waste control.

COM-74-70066/7GA PC-GPO
Bureau of the Census, Washington, D.C.
BOUNDARY AND ANNEXATION SURVEY, 1972.
Annual rept.
May 73, 60p
Library of Congress Catalog Card no. 73-600122.
Paper copy available from GPO $0.85 as C56.249:972.

Descriptors: *Census, *Annexation, *Boundaries, Tables(Data), Municipalities, Incorporated places.

The report provides information on changes in the boundaries of incorporated places as determined by the first in a series of annual boundary and annexation surveys conducted by the Bureau of the Census. The first survey was conducted in January 1971, with a follow-up survey in January 1972. Both surveys were designed to obtain boundary change and corporate status information through January 1 of the survey year. Tables in the report cover: Frequency of municipal boundary changes, by population size class; summaries of selected information on boundary changes reported by incorporated places of 2,500 or more population, by State; and those places of 2,500 inhabitants or more reporting one more boundary changes, by State and place; places reporting two or more boundary changes, by number of changes; the 51 places reporting gr*atest net increase in area; and incorporations, disincorporations, consolidations, mergers, reactivations, and annexations of one place by another.

CONF-730476-1 PC$3.00/MF$1.45
Reynolds Electrical and Engineering CO., Inc., Las Vegas, Nev. (Usa).
TUNNEL MINING AND CONSTRUCTION ACTIVITIES.
W. G. Flanges. 1973, 7p

Descriptors: Drill cores, Geology, Mining, Safety, Tunnels, Underground.

For abstract, see NSA 30 01, number 02393.

CONF-740505-1 PC$3.00/MF$1.45
Oak Ridge National Lab., Tenn. (Usa).
BACKGROUND CONCENTRATIONS OF MERCURY AND METHYLMERCURY IN UNPOLLUTED FRESHWATER ENVIRONMENTS.
J. W. Huckabee, and S. G. Hildebrand. 1973, 14p

Descriptors: (*Mercury, *Absorption spectroscopy), (*Water pollution, Mercury), Aquatic ecosystems, Fishes, Fly ash, Fresh water, Insects, Interfaces, Surface waters, Baseline measurements.

For abstract, see NSA 30 01, number 02294.

DOCKET-408027-11 PC$8.50/MF$1.45
Kerr-Mcgee Corp., Oklahoma City, Okla. (Usa).
SEQUOYAH URANIUM HEXAFLUORIDE PRODUCTION PLANT. AEC DRAFT ENVIRONMENTAL STATEMENT.
11 Apr 74, 108p

Descriptors: (*Sequoyah uf6 production plant, *Environment), (*Industrial plants, Environment), Accidents, Contamination, Cost, Cost benefit analysis, Hazards, Oklahoma, Pollution, Production, Radiation monitoring, Uranium hexafluoride.

For abstract, see NSA 30 01, number 00328.

IS-T-611 PC$9.25/MF$1.45
Ames Lab., Iowa (Usa).
STUDY OF IRON AND ALUMINUM RECOVERY FROM POWER PLANT FLY ASH.
D. C. Cavin. Apr 74, 121p
Contract W-7405-eng-82

Descriptors: (*Fly ash, *Separation processes), (*Iron, *Removal), (*Aluminium, Removal), Power plants, Reprocessing.

For abstract, see NSA 30 01, number 02280.

JPRS-62033 PC$3.25/MF$1.45
Joint Publications Research Service, Arlington, Va.
TRANSLATIONS ON ENVIRONMENTAL QUALITY. NUMBER 33.
20 May 74, 38p
Trans. from various jnls.

Descriptors: *Air pollution, *Water pollution, Pollution, Ecology, Translations.
Identifiers: Environmental quality.

The serial report contains translations from the world press concerning articles on the following: Brazil - Harmful effects of DDT condemned; Mexico - Pollution of Coatzacoalcos River; Volkswagen antipollution measures; Industrial parks program outlines environmental measures; USSR - Plan announced to halt pollution, evaporation of Caspian; Increased drinking water supply planned for Moscow; Soviet industry to convert to waste-free technology; Principles of classifying conservation documents; Krasnovodsk refinery improves waste treatment; Kalinin aeration station improves purity indicators; Commission on protection of nature established; Air, water purification methods for steel industry; News Briefs; West Germany - Ideas for combating environmental pollution.

JPRS-62114 PC$3.00/MF$1.45
Joint Publications Research Service, Arlington, Va.
TRANSLATIONS ON ENVIRONMENTAL QUALITY, NUMBER 35.
29 May 74, 21p
Trans. from various Jnls.

Descriptors: *Pollution, *Air pollution, *Water pollution, *International relations.
Identifiers: Environmental quality.

Contents:
Poland - News briefs;
Air pollution measures. Brazil- Network of environmental stations to cover the country. Mexico - Major pollution causes;
Little progress in water pollution control;
Pollution controls at cement plant. USSR - Progress in environmental quality;
Solid particle content near coke plant atmosphere. Netherlands - Anti-air pollution measures;
Sulfur dioxide emission in Rijswijk;
Pollution by metals in Rijnmond;
New dike effect on Hague environment. West Germany - New law requires fee from water polluters.

LBL-2243 PC$3.25/MF$1.45
California Univ., Berkeley (Usa). Lawrence Berkeley Lab.
APPLICATION OF VELOCITY-SELECTIVE FREEZE-PUSHING TO THE SEPARATION AND CHARACTERIZATION OF AIR-BORNE SOLID PARTICULATE MATTER IN AIR POLLUTION SAMPLES.
T. T. Shih, and L. F. Donaghey. Dec 73, 24p
CONF-740311-3
Contract W-7405-eng-48

Descriptors: (*Graphite, *Aerosols), (*Hematite, Aerosols), Air pollution, Interfaces, Particles, Sampling, Separation processes, Solids, Velocity.

For abstract, see NSA 30 01, number 02398.

N74-21733/2GA PC$5.75/MF$1.45
Max-Planck-Institut fuer Stroemungsforschung, Goettingen (West Germany).
ON WASTE PRODUCT LOADING OF WATERS AND WASTE WATER PURIFICATION ZUR ABFALLSTOFFBELASTUNG VON GEWAESSERN UND ZUR ABWASSERREINIGUNG.
P. E. M. Schneider. Jan 74, 53p BER-2-1974
Language in German.

Descriptors: *Wastes, *Water currents, *Water pollution, *Water reclamation, Biological effects, Chemical reactions, Microorganisms, Oxygenation, Wastes, Water quality, Water treatment.

For abstract, see STAR 1213

N74-22281/1GA PC$5.25/MF$1.45
Michigan Univ., Ann Arbor. Dept. of Atmospheric and Oceanic Science.
CHEMILUMINESCENT MEASUREMENT OF ATMOSPHERIC ACID.
Final Report.
D. H. Stedman, and G. L. Kok. 6 May 74, 41p
NASA-CR-138165, REPT-012119-1-F
Contract NGR-23-005-599

Descriptors: *Air pollution, *Gas analysis, *Gas detectors, Feasibility analysis, Hydrochloric acid, Nitrogen oxides.

For abstract, see STAR 1213

N74-22283/7GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
ESTIMATE OF CONTRIBUTION OF JET AIRCRAFT OPERATIONS TO TRACE ELEMENT CONCENTRATION AT OR NEAR AIRPORTS.
J. S. Fordyce, and D. W. Sheibley. May 74, 12p
NASA-TM-X-3054, E-7840

Descriptors: *Air pollution, *Chemical analysis, *Gas analysis, *Jet engine fuels, *Trace elements, Airports, Atmospheric composition, Exhaust gases, Neutron activation analysis.

For abstract, see STAR 1213

N74-22287/8GA PC$5.00/MF$1.45
Institut Royal Meteorologique de Belgique, Brussels.
ATMOSPHERIC POLLUTION. PART 1: SMOKE AND SULFUR DIOXIDE. PART 2: PRECIPITATION MEASUREMENTS USING STORAGE GAGES POLLUTION ATMOSPHERIQUE I. FUMEE ET ANHYDRIDE SULFUREUX II. MESURE DES RETOMBEES AU MOYEN DES JAUGES DE DEPOT BULLETIN MENSUEL, FEVRIER 1973.
Monthly Bulletin, Feb. 1973.
Feb 73, 37p
Subm-Prepared Jointly with Inst. D'Hyg. Et d'Epidemiol.
In French and Dutch.

Descriptors: *Belgium, *Pollution, *Precipitation (Meteorology), *Smoke, *Sulfur oxides, *Tables (Data), Air sampling, Rain gages, Weather stations.

For abstract, see STAR 1213

N74-22344/7GA PC$4.25/MF$1.45
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
A STOKES' VELOCITY PHOTOGRAPHIC METHOD FOR MEASURING THE SIZE DISTRIBUTION OF AEROSOLS.
A. Deepak. 21 Feb 74, 23p NASA-TM-X-64838

Descriptors: *Aerosols, *Particle size distribution, *Photographic measurement, Aluminum oxides, Particle motion, Propagation velocity, Stokes law (Fluid mechanics).

For abstract, see STAR 1213

N74-22591/3GA PC$7.50/MF$1.45
Tennessee Univ., Knoxville. Center for Business and Economic Research.
MEASURING AND MINIMIZING THE SOCIAL COST OF ENVIRONMENTAL POLLUTION.
Partial Final Report.
H. W. Henry. 29 Jan 73, 86p NASA-CR-138118
Contract NGR-43-001-021

Descriptors: *Environment pollution, *Industries, *Social factors, Government/industry relations, Industrial management, Law (Jurisprudence).

For abstract, see STAR 1213

N74-22609/3GA PC$4.50/MF$1.45
Environmental Research Inst. of Michigan, Ann Arbor. Infrared and Optics Div.
EXTENSION OF ERIM MULTISPECTRAL DATA PROCESSING CAPABILITIES THROUGH IMPROVED DATA HANDLING TECHNIQUES.
Technical Report, 1 Nov. 1971 - 31 Jan. 1973.
F. J. Kriegler. Jun 73, 28p NASA-CR-134268, ERIM-31650-158-T
Contract NAS9-9784

Descriptors: *Data processing, *Environmental monitoring, *Spectral reconnaissance, Computer systems design, Data management.

For abstract, see STAR 1213

PATENT-3 741 890 Not available NTIS
Department of Health, Education, and Welfare, Bethesda, Md. Patent Branch.
SOLID WASTE DISPOSAL AND WATER PURIFICATION METHOD AND APPARATUS.
Patent, *Filed 6 Aug 69, patented 26 Jun 73,
Richard D. Smith, and Dale A. Furlong. 26 Jun 73, 14p PAT-APPL-847 994,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Solid waste disposal, *Sewage treatment, *Patents, Gas turbines, Incinerators, Drying apparatus, Heat recovery, Reclamation, Water treatment.
Identifiers: PAT-CL-210-40, Waste recycling, Chars.

In the patent a solid waste disposal and water purification system is described with a waste receiving, shredding, and drying assembly, a gas turbine assembly for combusting hot fuel gases, and a gasifier assembly for pyrolyzing the waste and producing hot fuel gas and active char. The active char is removed from the gasifier assembly and is mixed with incoming polluted water for purification. The contaminated char is removed from the water which is then lime clarified, filtered and, if desired, sterilized and distilled. The contaminated char is reactivated for reuse in water purification or consumed in the gasifier assembly.

PB-232 775/7GA PC$4.00/MF$1.45
Port Authority of Allegheny County, Pittsburgh, Pa.
PITTSBURGH'S NEW RIDERSHIP PROGRAM,
Harold H. Geissenheimer. 18 Apr 74, 9p
Presented at the ATA Rail Transit Conference, San Francisco, Calif., 18 April 1974.

Descriptors: *Urban transportation, Projects, Rapid transit railways, Bus lines, Improvement, Routes, Central city.
Identifiers: Park and ride.

The New Ridership Program is based on improved service and equipment to the passenger at attractive fares with expanded information and promotion. The first step has been to improve service. The new system operates 95 Light Rail PCC Cars and 915 Diesel Buses on 171 routes traveling over 1,932 miles of route. In 1973, 91,753,819 passengers used the system.

PB-232 801/1GA PC$3.25/MF$1.45
Geological Survey, Raleigh, N.C.
MOVEMENT AND DISPERSION OF SOLUBLE MATERIALS IN SALEM CREEK, MUDDY CREEK, AND YADKIN RIVER, BETWEEN WINSTON-SALEM AND SALISBURY, NORTH CAROLINA.
Water-resources investigations. Final rept.,
K. L. Lindskov. Apr 74, 32p USGA/WRI-6-74, USGS/WRD-74-021

Descriptors: *Water pollution, *Industrial wastes, *Sewage, *Salem Creek, *Muddy Creek, Yadkin River, Stream flow, Flow rate, Sampling, Predictions, Mixing, Fluorescent dyes, North Carolina.
Identifiers: Tracer studies.

Wastes entering the Yadkin River from the Winston-Salem area, particularly during heavy rains, resulted in several major fish kill in the late 1960's and early 1970's. The actions undertaken to solve this problem included the collection of data on the time of travel and dispersion characteristics of the tributaries draining the Winston-Salem area and of the main stem of the Yadkin below their confluence. Fluorescent dye was used to simulate the movement of waterborne wastes under four different flow conditions over a reach of about 41 miles (66 kilometers) beginning at the sewage-treatment plant on Salem Creek and ending on the Yadkin River at High Rock Lake near Salisbury. Total travel time for the entire reach ranges from about 28 hours during periods of high streamflow to about 47 hours during periods of low flow.

PB-232 921/7GA PC$5.50/MF$1.45
GCA Corp., Bedfor, Mass.
STUDY AND EVALUATION OF COMPUTER CARPOOL PROGRAMS IN CERTAIN METROPOLITAN AREAS.
Final rept.,
David A. Bryant. Apr 74, 184p* GCA-TR-74-8-G EPA-450/3-74-041
Contract EPA-68-02-1337

Descriptors: *Passenger vehicles, *Urban transportation, *Coordination, *Computer programs, Evaluation, Surveys, Urban areas, Market research, Air pollution, Motivation, Incentives, Organizing, Bibliographies.
Identifiers: *Car pools, Metropolitan areas.

The report methodology is adopted in certain metropolitan areas to arouse public interest and support for carpooling by the use of computer matching to reduce the total number of vehicles committed to work trips, reduce the demand for scarce motor fuels, and reduce vehicle miles traveled. All these combined will contribute to the improvement of air quality in congested work areas in metropolitan centers.

PB-232 939/9GA PC$7.50/MF$1.45
Virginia Polytechnic Inst. of State Univ., Blacksburg. Water Resources Research Center.
A STOCHASTIC MODEL FOR THE JAMES.
Project completion rept. Jul 72-Jun 73,
Harry Bard, and Richard G. Krutchkoff. Aug 73, 86p W74-07843, OWRR-A-048-VA(1)
Contract DI-14-31-0001-3847

Descriptors: *Water pollution, *James River, *Virginia, Mathematical models, Stochastic processes, Fresh water, Stream flow, Temperature, Dissolved gases, Oxygen, Carbon, Carbon dioxide, Nitrates, Nitrites, Bacteria, Algae, Industrial wastes, Sewage, Computer programs.
Identifiers: Richmond(Virginia).

Modeling the James River Estuary and determining parameter sensitivity were major objectives of the project. The Schofield Model, a transient state model, simulated the James River using the available investigations for input data information. The sensitivity of the model predictions to changes in rate constants, fresh water flow rates, sewage input, and temperature was also investigated.

PB-232 947/2GA PC$3.75/MF$1.45
Wisconsin Univ., Madison. Water Resources Center.
ENVIRONMENTAL IMPACT ANALYSES: A REVIEW OF THREE METHODOLOGIES.
Partial technical completion rept.,
Maurice L. Warner, and Daniel W. Bromley. 1974, 75p* W74-08839, OWRR-B-057-WIS(3)
Contract DI-14-31-0001-3354

Descriptors: *Environmental impact statements, *Methodology, Preparation, Management guidelines, Reviews, Criteria, Projects, Idaho.
Identifiers: National Environmental Policy Act of 1969.

The National Environmental Policy Act of 1969 (NEPA) required the filing of environmental impact statements by Federal agencies proposing major actions significantly affecting the quality of the human environment. This research suggest bases for the evaluation and further development of methodologies used to prepare impact statements. Three methodologies are critically analyzed. Specific criteria for methodology evaluation are developed within the areas of: technical ecological content, practical applicability, and political utility. To provide a more concrete setting for this analysis, a test case involving a proposed U.S. Bureau of Reclamation water resources development project in Southwest Idaho is used.

PB-232 956/3GA PC$3.00/MF$1.45
Illinois Univ., Urbana. Water Resources Center.
LARGE-SCALE MASS BALANCE FOR LEAD IN SOUTHERN LAKE MICHIGAN.
Research rept. (Final),
Allen C. Cogley. Dec 73, 19p UILU-WRC-74-0085, WRC-RR-85 W74-08836, OWRR-A-057-ILL(1)
Contract DI-14-31-0001-3813

Descriptors: *Air pollution, *Aerosols, *Lead(Metal), *Lake Michigan, Dispersions, Sources, Turbulent boundary layer, Precipitation(Meteorology), Interfaces, Mathematical models.
Identifiers: Automobile exhaust, Chicago(Illinois), *Atmospheric transport, *Path of pollutants, *Sinks(Biosphere).

A large-scale, order-of-magnitude mass balance for lead in the near field of Chicago (the source) is presented. Both experimental data and simple physical modeling are used to estimate the transport of lead from the major sources to the near-field sinks of Southern Lake Michigan, its watershed soil, and the surroundings (losses from the system under question). The results show that atmospheric transport of lead aerosols to a sink like Lake Michigan is about two orders of magnitude greater than other transport mechanism. To perform a detailed (small-scale) mass balance for lead,, in support of the large-scale results, a complete model of atmospheric, aerosol transport and deposition is necessary and dominant.

PB-232 957/1GA PC$5.75/MF$1.45
Maryland Univ., College Park. Water Resources Research Center.
TRANSIENT ANALYSIS OF A STATE PARK EXTENDED AERATION WASTEWATER FACILITY.
Completion rept. Jul 71-Sep 73,
W. W. Hellier, Jr., and T. W. Cadman. 1973, 204p TR-24 W74-08838, OWRR-A-021-MD(1)
Contract DI-14-31-0001-3520

Descriptors: *Sewage treatment, *Aeration, *Pennsylvania, Activated sludge process, Waste water, Sampling, Dissolved organic matter, Biochemical oxygen demand, Solids, Mathematical models, Simulation, Kinetics.
Identifiers: Prince Gallitzin State Park.

Experimental data on the transient operation of the extended aeration wastewater treatment plant at Pennsylvania's Prince Gallitzin State Park were collected and the system has been mathematically modeled. Time-variant inlet hydraulic flows were obtained through continuous measurement, and organic loading data were based on grab samples analyzed for biochemical oxygen demand (BOD) and volatile suspended solids concentration. Effluent BOD was used as the criterion for comparing the predicted with the observed time-variant plant response to loadings. Three mathematical models were developed for the simulation.

PB-232 958/9GA PC-GPO/MF$1.45-NTIS
Utah Water Research Lab., Logan.
COMPREHENSIVE MANAGEMENT OF PHOSPHORUS WATER POLLUTION.
Socioeconomic environmental studies series,
D. B. Porcella, A. B. Bishop, J. C. Andersen, O. W. Asplund, and A. B. Crawford. Feb 74, 429p* W74-08826, EPA-600/5-74-010
Contract EPA-68-01-0728
Paper copy available from GPO $4.05 as EP1.23:600/5-74-010.

Descriptors: *Water pollution, *Surface waters, *Phosphorus, Mathematical models, Lakes, Rivers, Fluid flow, Nutrients, Primary biological productivity, Sources, Industrial wastes, Sewage, Cost effectiveness, Management, Lake Michigan, Lake Erie.
Identifiers: Eutrophication.

The environmental problems of phosphorus pollution are examined using an activity analysis approach to account for phosphorus inputs to surface waters. For purposes of analysis, the study assumes phosphorus to be the limiting factor in algal growth and eutrophication. A mass flow model, general enough to be applied to specific lakes or river basins, was developed in order to relate the flow of phosphorus from all activities in a basin to the consequences of eutrophication. Various control tactics to limit mass flow and thus eutrophication were defined from the standpoint of both supply and demand for phosphorus producing products and the management of phosphorus uses. Combinations of feasible controls designed as strategies, were applied to the model to determine the cost-effectiveness of the strategies in minimizing eutrophication. A hypereutrophic hypothetical lake basin, Lake Michigan, and Lake Erie were analyzed as case examples to test the model and control methods.

PB-232 959/7GA PC-GPO/MF$1.45-NTIS
Environmental Protection Agency, Washington, D.C. Hazardous Materials Advisory Committee.
NITROGENOUS COMPOUNDS IN THE ENVIRONMENT.
Dec 73, 189p* EPA-SAB-73-001 W74-08835
Paper copy available from GPO $2.20 as EPA-SAB-73-001.

Descriptors: *Nitrogen organic compounds, *Nitrogen inorganic compounds, *Air pollution, *Water pollution, *Reviews, Ureas, Nitroso compounds, Amines, Biochemical oxygen demand, Sewage treatment, Ammonia, Water analysis, Nitrogen oxides, Agricultural wastes, Nutrients, Chemical analysis, Toxicity, Surface water runoff, Waste water, Fertilizers, Industrial wastes, Nitrites, Carcinogens.
Identifiers: Water pollution control, Nitrates, Sinks(Biosphere), Water pollution effects(Animals), Water pollution effects(Plants), Air pollution control, Water pollution control.

The report is a series of papers on the sources and methods of control and the environmental and health effects of nitrogenous compounds. Diverse aspects of municipal and industrial sources are discussed--waterborne, atmospheric, agricultural, and industrial processes generating nitrogenous compounds. Attention is given to nitrogenous materials in waste and surface waters, efficiency of sewage treatment, effectiveness of the conventional BOD test, and the contribution of urban runoff and landfill leakage to the overall nitrogen load in the environment. Concentrations, sources, sinks, the transformation of nitrogenous materials in the lower atmosphere, control measures for stationary and mobile sources, retrofit systems for used cars, and new engine systems are reviewed. Plant nutrients, including fertilizers, and animal wastes are considered. The growing problems resulting from concentrated centralized livestock feedlots and methods of control are pointed out. Nitrogen is discussed as a nutrient essential to living organisms and as a toxicant within the aquatic environment. The carcinogenicity of nitrosamines and their precursors is described as a potential danger to health. Individual nitrogenous compounds are appropriately identified throughout the report. Analytical procedures for the identification and quantification of nitrogenous compounds are reviewed. (Modified author abstract)

PB-232 968/8GA PC-GPO-MF$1.45-NTIS
Virginia Inst. of Marine Science, Gloucester Point.
INVESTIGATION OF SURFACE FILMS - CHESAPEAKE BAY ENTRANCE.
Environmental protection technology series,
William G. MacIntyre, Craig L. Smith, John C. Munday, Victoria M. Gibson, and James L. Lake.
Feb 74, 179p W74-08831, EPA-670/2-73-099
Paper copy available from GPO $2.05 as EP1.23:670/2-73-099.

Descriptors: *Oil spills, *Estuaries, *Chesapeake Bay, Fuel oil, Motion, Ocean currents, Tides, Remote sensing, Gas chromatography, Thickness, Chlorohydrocarbons, Fatty acids, Sampling, Degradation, Oil pollution, Predictions, Pesticides, Plankton.
Identifiers: *Oil spreading processes.

Experimental point source oil releases have been conducted in the Chesapeake Bay mouth area. Predictions of oil slick motion were tested, and slicks were sampled and analyzed to measure their aging rates over periods up to 32 hours. Remote sensing techniques were used to detect and measure the spreading rate of oil. Some laboratory oil film aging experiments were done to further document and elucidate aging processes. Results indicate a reasonable motion prediction, an explanation of the non-biological initial aging of oil films, and a fair corroboration of a theoretical oil spreading model. Indigenous surface films in the study area were analyzed for lipid and chlorinated hydrocarbon content. Hydrocarbons were 300-500 microgram per liter and fatty acids and esters 700-7800 microgram per liter in surface film samples. Chlorinated hydrocarbons were generally less than 100 parts per trillion in surface films, in contrast to some earlier high concentrations found in Biscayne Bay.

PB-232 971/2GA PC$3.25/MF$1.45
Illinois Univ., Urbana. Water Resources Center.
DISTRIBUTION OF SELECTED TRACE METALS IN SOUTHERN LAKE MICHIGAN AND LOWER GREEN BAY.
Research rept., (Final)
Harry V. Leland, and Neil F. Shimp. Apr 74, 35p
WRC-RR-84, UILU-WRC-74-0084 W74-08934, OWRR-A-052-ILL(2)
Contract DI-14-31-0001-3213

Descriptors: *Metals, *Lake Michigan, Sediments, Trace elements, Distribution(Property), Cadmium, Chromium, Cobalt, Copper, Iron, Lead(Metal), Manganese, Nickel, Zinc, Green Bay, Water pollution.
Identifiers: Heavy metals, *Water quality data.

The distribution of selected trace metals in water, suspended matter and sediments of southern Lake Michigan and in surficial sediments of lower Green Bay is described. Accumulations of As, Br, Cr, Cu, Hg, Pb, and Zn in fine-grained surficial sediments of southern Lake Michigan, apparently determined by patterns of sediment desposition, correlate closely with sediment concentrations of organic carbon and iron. Organic carbon concentrations of surficial sediments are more highly correlated with concentrations of Cu, Pb and Zn in surficial sediments of lower Green Bay than are either Fe or Mn contents. Mean concentrations of trace metals in suspended matter near the sediment-water interface of southern Lake Michigan equal or exceed amounts in surficial sediments. Horizontal (geographic) and vertical distributions of concentrations of nine trace metals (Cd, Cr, Co, Cu, Fe, Pb, Mn, Ni and Zn) in waters of southern Lake Michigan were examined during the period June-October, 1971.

PB-232 979/5GA PC-GPO/MF$1.45-NTIS
Raytheon Co., Portsmouth, R.I. Oceanographic and Environmental Dept.
DESIGN OF COST-EFFECTIVE WATER QUALITY SURVEILLANCE SYSTEMS.
Socioeconomic environmental studies series,
Charles V. Beckers, and Stanley G. Chamberlain.
Jan 74, 419p EPA-600/5-74-004
Contract EPA-68-01-0703
Paper copy available from GPO $4.05 as EP1.23:600/5-74-004.

Descriptors: *River basins, *Water quality, Cost effectiveness, Mathematical models, Systems analysis, Surveys, Computer programs.
Identifiers: *Water pollution sampling, Data collection.

The report presents the development and successful demonstration of quantitative methods for the design of river basin water quality surveillance systems for pollution abatement. The methods provide a systematic approach to the consideration of expected stream conditions, system characteristics, equipment performance, and cost in the selection of a preferred system design from among a number of candidates. In the systems approach, the total system is evaluated for cost and effectiveness. Mathematics previously developed to describe the effectiveness of sampling is used. The analysis of performance draws heavily on reliability and maintainability technology. Data availability remains a constraint to the general application of the methods. The methods are computerized and the computer programs are detailed. They make use of the information available from the computerized river basin models now under general development. They are demonstrated to function satisfactorily on the Beaver River Basin when artificial data are used to supplement the data base. It is concluded that the methods are acceptable for use by governmental water quality agencies under the existing constraints.

PB-232 996/9GA PC$4.75/MF$1.45
Utah Water Research Lab., Logan.
EVALUATING WATER REUSE ALTERNATIVES IN WATER RESOURCES PLANNING.
Projection completion rept. 1 Jul 72-31 Dec 73,
A. Bruce Bishop, William J. Grenney, Rengasan Narayanan, and Stanley L. Klemetson. Jan 74, 147p PRWG123-1 OWRR-B-075-UTAH(1), W74-08940
Contract DI-14-31-0001-3941

Descriptors: *Water reuse, *Water pollution control, *Utah, *Water resources, Systems analysis, Waste water, Linear programming, Optimization, Cost analysis, Water quality, Water management, Mathematical models, Logan River, Water supply, Computer programs.
Identifiers: *Waste water reuse, Salt Lake City(Utah), TSHIP computer program.

Water reuse is a recognized option for augmenting water supplies to provide for expanded water needs. A methodology is developed for examining optimal strategies for water reuse within the context of the total water resources system, including both the provision of supplies for various uses and management of wastewaters. A model of the water resources system is formulated as a 'transportation' or 'transshipment' problem in linear programming depicting the possible sources of supply, including effluent sources available for reuse, which can be used to satisfy the requirements of various water users. The optimizing objective in the model is to minimize the cost of meeting water supply requirements and of wastewater treatment to satisfy water quality standards. The Lower Jordan River Basin, which encompasses the Salt Lake City, UT, metropolitan area, is used as a case study for applying and testing the model.

PB-232 997/7GA PC$3.75/MF$1.45
Puerto Rico Univ., Mayaquez. Water Resources Research Inst.
RELATIONSHIP BETWEEN BOD REMOVAL AND LAS DETERGENT REMOVAL.
Completion rept.,
Ning Hsi Tang. May 74, 66p W74-08939, OWRR-A-035-PR(1)

Descriptors: *Biochemical oxygen demand, *Sulfonates, *Activated sludge process, *Trickling filtration, *Sewage treatment, Detergents, Water analysis, Aliphatic compounds, Process control, Correlation, Removal.

Traditionally, biological process efficiency is measured by its BOD removal. However, a period of 5 days is required to determine the BOD in wastewater. In detergent, LAS (Linear Alkylate Sulfonate) is a basic organic element which is readily degraded in municipal biological processes. The fact that LAS can be rapidly determined within 30 minutes makes its use advantageous for process control. The results of the study indicate that BOD removal and LAS removal in both, activated sludge and trickling filter processes are significantly correlated. It is very likely that the % LAS removal of a biological process can be used to predict the % BOD removal of the same process. (Modified author abstract)

PB-233 018/1GA PC$3.00/MF$1.45
Interstate Electonics Corp., Anaheim, Calif. Oceanics Div.
EXECUTIVE SUMMARY, DEVELOPMENT OF CRITERIA TO CONTROL OCEAN DUMPING.
Summary rept.,
Jan 74, 18p* IEC-4460C1612
Contract EPA-68-01-0796
See also PB-233 019.

Descriptors: *Water pollution control, *Oceans, *Waste disposal, Coastal regions, Spoil, Dredging, Industrial wastes, Sewage, Outfall sewers, Sites, New York Bight, South Carolina, Gulf Coast, California, Puget Sound.
Identifiers: *Ocean waste disposal, Charleston(South Carolina), San Francisco(California).

The report provides a brief executive summary of the ocean waste disposal study undertaken by Interstate Electronics Corporation. This special study concentrated on waste disposal practices in six geographic areas of the United States.

PB-233 019/9GA PC$4.00/MF$1.45
Interstate Electronics Corp., Anaheim, Calif. Oceanics Div.
GUIDELINES FOR DEVELOPMENT OF CRITERIA FOR CONTROL OF OCEAN WASTE DISPOSAL.
Final rept.
Feb 74, 99p* IEC-4460C1544
Contract EPA-68-01-0796
See also PB-233 018.

Descriptors: *Water pollution control, *Oceans, *Waste disposal, Coastal regions, Monitors, Spoil, Dredging, Industrial wastes, Sewage, Outfall sewers, Sites, New York Bight, South Carolina, Gulf Coast, California, Puget Sound.
Identifiers: *Ocean waste disposal, *Charleston(South Carolina), *San Francisco(California).

The report is the final one of a group of successive volumes related to a survey of ocean waste disposal practices in six major coastal areas of the United States. It specifically addresses the problems associated with disposal site selection, criteria development and control and monitoring of disposal operations. The purpose of the study, of which this is the final report, was to assist the Ocean Disposal Program of the Environmental Protection Agency in the development of criteria for the control of ocean waste disposal.

PB-233 053/8GA PC$33.25/MF$1.45
Milwaukee Urban Observatory, Wis.
LOCAL GOVERNMENT FINANCE IN THE MILWAUKEE SMSA. VOLUME I. PAST TRENDS AND PROJECTIONS OF EXPENDITURES AND REVENUES.
Final rept.,
Arthur P. Becker. 1974, 603p UO-LCCM-MIL-74-012-1
Contract DOT-H-987

Descriptors: *Local government activities, *Wisconsin, *Financing methods, Standard metropolitan statistical areas, Reviews, Economic analysis, Municipal services, Comparative studies, Urban areas, Counties, Suburban areas, Management information systems, Demand(Economics), Statistical data, Projections, Revenue, Trends.
Identifiers: *Milwaukee(Wisconsin).

The study consists of an intensive analysis of the status and prospects for financing local public services in the Milwaukee metropolitan area. Comparisons are made between the Milwaukee SMSA, Milwaukee County, the city of Milwaukee, the suburbs of Milwaukee County, and the non-Milwaukee suburbs of the SMSA. The report provides basic information about the demands for services and the funds required to finance local operations. It presents a method for projecting both expenditures and revenues, supplies projections for each to 1975, and then compares anticipated or required public expenditures with anticipated revenue yields for that year.

PB-233 059/5GA PC$4.50/MF$1.45
Ida Grove City Manager, Iowa.
A FINANCIAL PLAN AND PROGRAM OF SERVICES FOR THE CITY OF IDA GROVE, IOWA - A PILOT PROJECT.
Final rept.
1973, 123p USCSC-73-DX-19C-28

Descriptors: *Urban planning, *Iowa, Budgeting, Financial planning, Program design, Public administration, Management methods, Conversion, Municipal services.
Identifiers: *Ida Grove(Iowa).

The report covers two separate but related items--a live item budget for the city of Ida Grove, Iowa (population 2200), and a companion program budget for the city for the same period of time. Included in the letter of transmittal accompanying the program budget is a discussion of the changes in approach to municipal administration represented by the conversion to a program budget.

PB-233 071/0GA PC$11.00/MF$1.45
International Road Federation, Washington, D.C.
WORLD SURVEY OF CURRENT RESEARCH AND DEVELOPMENT ON ROADS AND ROAD TRANSPORT (1973).
Annual rept.
Dec 73, 581p*
Contract FH-11-7656
See also report PB-180 958.

Descriptors: *Roads, *Reviews, Highway planning, Research projects, Research management, Surveys, South America, Australia, Europe, Africa, Canada, Taiwan, Great Britain.

The 1973 annual world survey of research and development on roads and road transport reports on current studies in 71 countries excluding the United States. A total of 5,123 studies are reported with a brief abstract. The studies are classified by country and by technical subject area. Two special indepth studies are included: 'Prevention of Bridge Deck Deterioration' by Mr. Russell H. Brink and 'Long-Span Bridges in Europe' by Mr. D. Allen Firmage.

PB-233 111/4GA PC-GPO/MF$1.45-NTIS
Fairfax County, Va.
A PLANNED MAINTENANCE MANAGEMENT SYSTEM FOR MUNICIPAL WASTEWATER TREATMENT PLANTS.
Environmental protection technology series,
Donald H. Sargent, and David A. Rudich. Nov 73, 120p EPA-600/2-73-004, W74-08944
Paper copy available from GPO $1.55 as EP1.23:600/2-73-004.

Descriptors: *Sewage treatment, *Maintenance, Waste water, Industrial water, Operating costs, Scheduling, Manpower, Hydraulic equipment, Instrumentation, Preventive maintenance, Virginia, Management.
Identifiers: Fairfax County(Virginia).

A Planned Maintenance Management System (PMMS) has been developed and successfully demonstrated at the 18-MGD Lower Potomac Plant of Fairfax County, VA., establishing a model maintenance management program for wastewater treatment plants throughout the United States. This PMMS provides for the specific maintenance needs of each item of plant equipment and reduces the maintenance of complex equipment to simple procedures. For each procedure the PMMS details the methods, materials, tools and personnel required; schedules the task; and provides for data recording and feedback. The success of this PMMS during the 12-month demonstration phase was measured by a steady downward trend in the malfunction of mechanical equipment. Incipient failures were detected in many cases and corrective action was taken to avoid breakdowns. This report describes the PMMS in technical detail; discusses the installation of the PMMS, including acceptance by the mechanics and coordination with plant operations; and outlines the application of the PMMS to other wastewater systems.

PB-233 117/1GA PC-GPO/MF$1.45-NTIS
Battelle Columbus Labs., Ohio.
DEVELOPMENT OF PREDICTIONS OF FUTURE POLLUTION PROBLEMS.
Socioeconomic environmental studies series,
James E. Flinn, and Robert S. Reimers. Mar 74, 222p* W74-08946, EPA-600/5-74-005
Contract EPA-68-01-1837
Paper copy available from GPO $2.40 as stock no. EP1.23:600/5-74-005.

Descriptors: *Pollution, Energy, Trace elements, Air pollution, Water pollution, Hazardous materials, Automotive fuels, Particulates, Water quality, Forecasting, Potable water, Strip mining, Land use, Electromagnetic radiation.
Identifiers: Liquid waste disposal, Fine particulates.

The report describes the results of a program to identify, rank and project short- and intermediate-term future pollution problems. Identification was accomplished using three independent search approaches based on industrial production, environmental, and societal trends and activity. Nine ranking factors were devised to select ten most serious problems from the initial list. The factors included: persistence; mobility/pervasiveness; environmental, technological, social, and political complexity; physiological risk; research needs; and bulk or volume of the pollutant. The ten selected problems in rank order are as follows: Impacts of new energy initiatives; geophysical modifications of the earth; trace element (metal) contaminants; proliferating hazardous and toxic chemicals; emissions from new automobile fuels, additives, and control devices; disposal of waste sludges, liquids, and solid residues; critical radiation problems; fine particulates; expanding drinking water contamination; and irrigation practices. Five to ten year projections were made of the ten problems which resulted.

PB-233 130/4GA PC$3.75/MF$1.45
Hawaii Univ., Honolulu. Water Resources Research Center.
APPLICATION OF REVERSE OSMOSIS TECHNOLOGY TO HAWAIIAN LOW QUALITY WATERS.
Technical rept.,
Bei-Jiann Chang, Reginald H. F. Young, and James C. S. Chou. Nov 73, 60p TR-73 W74-09052, OWRR-OWRR-A-036-HI(1)
Contract DI-14-31-0001-3811

Descriptors: *Water pollution control, *Water treatment, *Desalting, Waste water, Osmosis, Ground water, Brackish water, Pilot plants, Water quality, Performance evaluation, Feasibility, Water reclamation, Cost estimates, Hawaii.
Identifiers: Oahu Island, Reverse osmosis.

A study of the application of reverse osmosis technology to the treatment of Hawaiian low quality waters was conducted. The purpose was to investigate the technical and economical feasibility of utilizing reverse osmosis technology to renovate waste waters after varying degrees of conventional treatment, and to desalt Hawaiian brackish groundwater from both basaltic and reef limestone aquifers. The experimental investigation of the technical feasibility of renovating waste water and desalting brackish groundwater was conducted with a small reverse osmosis pilot unit at four test sites on the island of Oahu. The operation of the reverse osmosis pilot unit in processing waste waters suffered from the problem of performance decline. However, the pilot unit's operation with brackish groundwater yielded promising results. Treatment expenditures of the two schemes were estimated at 97.8 and 103.2 cents per 1000 gallons of treated waste water. (Modified author abstract)

PB-233 131/2GA PC$3.00/MF$1.45
California Univ., Santa Barbara. Dept. of Economics.
EFFICIENCY AND EQUITY IN AUGMENTING WATER SUPPLY.
Completion rept.,
Lloyd J. Mercer, and W. Douglas Morgan. Dec 73, 24p W74-09051, OWRR-A-041-CAL(1)

Descriptors: *Water supply, *Benefit cost analysis, Mathematical models, Investments, Financing, Taxes, Demand(Economics), Efficiency, California.

Identifiers: Santa Barbara County(California), San Luis Obispo County(California).

The study includes analysis of two issues in augmenting water supply: efficiency and equity. The efficiency analysis rests on an operational (computerized) benefit cost model developed to evaluate the optimal timing of investment for water supply augmentation. Benefits in this model are estimated by both an opportunity cost approach and a willingness to pay approach with both parallel shifts and rotating (around the initial intercept) shifts of the water demand curve which is estimated in a linear fashion. The equity portion of the study entails analysis of the geographical distribution of benefits relative to payments with alternative plans for financing the study project. Plans analyzed include: (a) full reliance on a uniform countywide property tax to cover the financial obligation incurred; and (b) a unit charge (long run financial or resource cost) to water districts for delivered water and a countywide property tax to meet any remaining obligation.

PB-233 134/6GA PC-GPO/MF$1.45-NTIS
South Dakota State Univ., Brookings. Dept. of Civil Engineering.
QUANTIFICATION OF POLLUTANTS IN AGRICULTURAL RUNOFF.
Environmental protection technology rept.,
James N. Dornbush, John R. Anderson, and Leland L. Harms. Feb 74, 159p EPA-660/2-74-005, W74-08942
Contract EPA-68-01-0030, Grant EPA-R-800400
Paper copy available from GPO $1.90 as stock no. EP1.23:660/2-74-005.

Descriptors: *Water pollution, *Surface water runoff, *South Dakota, *Agricultural wastes, Snowmelt, Rainfall, Sediments, Sampling, Nutrients, Pesticides, Bacteria, Water quality, Residues, Quantitative analysis.

Surface runoff from snowmelt and rainfall in eastern South Dakota was measured during a three year period. The size of the research sites ranged from 7.18 to 18.69 acres, and all sites had crops of corn, oats, pasture or hayland. Composite samples of the runoff were used for various chemical, physical and biological determinations. Runoff samples from 108 snowmelt events and 36 rainfall events were collected. Sediment losses were considerably lower than anticipated. Pesticide concentrations were low in both water and sediment samples, and were usually less than the analytical test limits. Coliform and fecal levels were consistently greater than accepted surface water quality criteria. Most of the nutrients were found to be soluble and/or associated with snowmelt runoff.

PB-233 140/3GA PC$10.25/MF$1.45
Massachusetts Inst. of Tech., Cambridge. Dept. of Civil Engineering.
PERFORMANCE OF AN EMBANKMENT CONSTRUCTED ON VARVED CLAY.
Interim technical rept.,
David H. Connell, John E. Garlanger, and Charles C. Ladd. May 73, 141p R73-26, Soils Mechanics Pub-321
See also report dated Oct 69, PB-191 402.

Descriptors: *Roads, *Embankments, Soil stabilization, Pore pressure, Consolidation, Soil dynamics, Clays, Massachusetts.
Identifiers: Interstate highways, Varved clay, Finite element analysis.

The performance of a 36 ft high embankment constructed in two stages on a deep deposit of varved clay as part of I-91 in Northampton, Mass. is analyzed. The geology, site conditions, field settlement and pore pressure data, and the results of an extensive laboratory program are presented. Emphasis is placed upon comparisons of calculated versus measured field behavior. Factors of safety were determined. Undrained settlements and pore pressures were analyzed. Field consolidation behavior was studied. Recommendations are made regarding soil parameters and methods of analyses for design of future embankments in the area.

PB-233 144/5GA PC$7.25/MF$1.45
Radian Corp., Austin, Tex.
SOLID WASTE DISPOSAL.
Final rept.,
Nancy P. Phillips, and R. Murray Wells. May 74, 314p* RAD-TN-200-045-04 EPA-650/2-74-033
Contract EPA-68-02-1319

Descriptors: *Sludge disposal, *Desulfurization, *Flue gases, Waste disposal, Sewage disposal, Scrubbers, Industrial wastes, Phosphates, Taconite, Coal, Tailings, Mining, Lagoons(Ponds), Earth fills, Gypsum.
Identifiers: Air pollution control, *Limestone scrubbing, Sanitary landfills.

The purpose of the present investigation is to identify available technologies developed in other industries that may be applicable to lime/limestone scrubber sludge disposal. Much of the technology already developed for phosphate slimes, by-product gypsum, taconite tailings, coal ash, and acid mine drainage sludge is applicable to scrubber sludge disposal. Alternative disposal methods available for scrubber sludge, including deep mine disposal, strip-mined land reclamation, and utilization, possess some degree of potential. Based on presently available data, there are no insurmountable technological problems in disposing of scrubber sludge in an environmentally acceptable manner.

PB-233 157/7GA PC$7.50/MF$1.45
Pennsylvania State Univ., University Park. Inst. for Research on Land and Water Resources.
COMMUNITY EFFECTS OF HIGHWAYS REFLECTED BY PROPERTY VALUES.
Final rept. 1 Jul 71-31 Aug 73,
Hays B. Gamble, C. John Langley, Jr., Robert D. Pashek, Owen H. Sauerlender, and Richard D. Twark. Aug 73, 337p DOT-FH-11-7800
Contract DOT-FH-11-7800

Descriptors: *Highways, *Regional information systems, *Community relations, *Property values, Traffic noise, Air pollution, Survey methods and procedures, Carbon monoxide, Graphical analysis, Interviews, Sociopsychological surveys, Household relationships, Environmental impacts.
Identifiers: Noise pollution, *Accessibility.

Four residential communities abutting interstate highways were examined to determine the effects of highway generated noise, air pollution, and regional accessibility on single-family residential property values. Numerous household characteristics, traffic mix, volume, and speed and measures for noise, carbon monoxide, oxides of nitrogen, hydrocarbons, and particulates were studied. Noise and carbon monoxide contour lines were plotted for one-half mile on either side of the highways, and more than 1,100 residents were interviewed to record their perceptions of the environmental disturbances.

PB-233 164/3GA PC$3.25/MF$1.45
Conservation Foundation, Washington, D.C.
THE DEMOGRAPHIC, POLITICAL, AND ADMINISTRATIVE SETTING.
Carl Feiss, Ruth McQuown, Paul Roberts, and Rodney May. Sep 73, 37p W74-09058, OWRR-C-4022(9004)(2)
Study No. 1 on Rookery Bay Land Use Studies. Environmental Planning Strategies for the Development of a Mangroove Shoreline. Prepared by Rosenstiel School of Marine and Atmospheric Science, Miami, Fla.

Descriptors: *Estuaries, *Conservation areas, *Shoreline management, *Florida, Regional planning, Environmental engineering, Land use, Social conditions, Political objectives, Management methods, Protection.
Identifiers: *Collier County(Florida), *Rookery Bay, *Mangrove shorelines, Natural sanctuaries.

The social, political, and managerial issues impacting a mangrove-estuarine areas in Collier County, Florida, are discussed relative to the development of land-use strategies to protect the area's natural sanctuary, Rookery Bay. Population, employment, land ownership government, planning machinery, citizen activities, political climate, and development pressures of the area are examined as they effect the sanctuary. Several alternative approaches for the future of the sanctuary are offered and recommendations are made for protective action.

PB-233 172/6GA PC$3.25/MF$1.45
Federal Highway Administration, Washington, D.C. Structures and Applied Mechanics Div.
ROAD ROUGHNESS TECHNOLOGY, STATE OF THE ART.
Final rept.,
Glenn G. Balmer. Dec 73, 39p* FHWA-RD-73-54

Descriptors: *Pavements, *Surface roughness, Reviews, Measurement, Profilometers, Safety, Performance evaluation, Quality assurance, Loads(Forces), Slopes, Measuring instruments, Service life, Ratings.

The paper gives an overview of road roughness technology, lists the most prominent equipment used in longitudinal profile evaluations, and discusses uses of the measurements. Several types of roughness measurement equipment are operational for the purpose of measuring riding quality; whereas, development of equipment, reduction procedures, and meaningful acceptance criteria of roughness for highway safety, for predicting pavement loading from heavy vehicles, and for determining pavement life expectancy have not reached the point where the equipment and procedures are operational for large scale road inventory purposes.

PB-233 178/3GA PC$5.50/MF$1.45
Oregon State Univ., Corvallis. Dept. of Agricultural Chemistry.
THE CHEMICAL CONVERSION OF SOLID WASTES TO USEFUL PRODUCTS.
Environmental protection technology series,
James F. Barbour, Robert R. Groner, and Virgil H. Freed. Apr 74, 177p* EPA-670/2-74-027
Grant EPA-R-00242

Descriptors: *Solid waste disposal, *Agricultural wastes, *Reclamation, *Materials recovery, Refuse, Chemical engineering, Plastics, Crosslinking, Acetylation, Etherification, Straw, Pulping, Hydrogenation, Pilot plants, Economic analysis, Cost estimates.

The use of solid wastes as raw materials for the production of useful products depends primarily on the successful application of chemical and engineering technology to waste disposal problems. The objectives of this study were to: (1) identify the chemical nature of the constituent of solid wastes, (2) investigate transformation process, and (3) conduct engineering and economic evaluation of pilot plant operations. The results of this study will be useful in the development of a solid waste chemical transformation facility, which will be capable of recovering waste generated from municipal, commercial, and agricultural sources for reutilization processes. This report was designed to provide the impetus for continued studies on reutilization processes rather than the culmination of a research effort.

PB-233 183/3GA PC$5.25/MF$1.45
Illinois Univ., Urbana. Center for Advanced Computation.
SYSTEM ENERGY AND RECYCLING: A STUDY OF THE BEVERAGE INDUSTRY.
Special rept.,
Bruce Hannon. 17 Mar 73, 44p CAC-23 NSF-RA/N-73-030

Revision of report dated 5 Jan 72. Supersedes PB-229 183.

Descriptors: *Solid waste disposal, *Containers, *Reclamation, *Energy consumption, Cans, Bottles, Glass, Metals, Plastics, Economics, Aluminum, Collection, Hauling.
Identifiers: *Beverage containers, Waste recycling.

An energy analysis has been performed on the soft drink, beer and milk container systems. The study shows that the energy required to deliver a unit of beverage to the consumer is about three times more in throwaway glass containers than in returnable bottles or bimetallic cans. The energy cost of recycling glass (collecting, separating and remelting) is greater than the comparable cost of mining materials for new bottles. All aluminum cans are about 38% more energy intensive than bimetallic cans. The retail dollar purchase is about 30 percent more for soft drink throwaways, and slightly higher if litter and solid waste disposal costs are added. To complete this study it was necessary to examine the metal, paper, glass and plastics industries in considerable detail. A summary of the energy ratios derived in this report is given. (Modified author abstract)

PB-233 184/1GA PC$4.00/MF$1.45
Datatronic Systems Corp., Panorama City, Calif. Computer Sciences and Environmental Technology Div.
BIBLIOGRAPHY ON AIR POLLUTION FORECASTING BY COMPUTER AND DIFFUSION MODELS.
Final rept. 1970-73,
M. P. Milane. 22 Dec 73, 99p* DC-73-78144

Descriptors: *Air pollution, *Bibliographies, *Computerized simulation, Forecasting, Diffusion, Models, Exaust emissions, Pollutants, Aerosols, Hydrocarbons, Sulfur dioxide, Nitrogen oxides, Atmospheric motion, Petroleum industry, Chemical industry, Meteorology, Smog, Urban areas, Computer programs, Mathematical models, Combustion products, Carbon monoxide.

A computer compilation of approximately 76 abstracts on air pollution forecasting via computer are presented. Areas covered are: forecasting by computer, models, computer programs, diffusion models, data handling systems, photochemical reactions, particules, plume behavior, simulation, topographic interactions, transport, urban areas, and atmospheric turbulence. Both U.S. and foreign literature is covered in the report, with a comprehensive index by subject.

PB-233 187/4GA PC$4.50/MF$1.45
International Joint Commission-United States and Canada. Great Lakes Water Quality Board.
GREAT LAKES WATER QUALITY.
Annual rept. no. 2, Apr 73-Apr 74.
Apr 74, 121p* IJC/DOS-7401
See also report dated Apr 73, PB-233 188.

Descriptors: *Water pollution abatement, *Great Lakes, Water quality, Project planning, Contaminants, Fishes, Industrial wastes, Mercury(Metal), Toxicity, Sewage, Land use, Dredging, Law enforcement, Phosphorus, United States, Canada.
Identifiers: *Water quality data.

The report provides an assessment of the present water quality of the Great Lakes and their connecting channels and critically examines the data collection and analysis programs available for this evaluation. The status of remedial programs being implemented to achieve the objectives for water quality in the lakes as agreed to under the 1972 Canada-U.S. Agreement is reviewed. The report highlights progress in reducing pollution from municipal waste discharges and notes that while significant progress is being made, particularly with regard to reducing phosphorus inputs to control eutrophication, several major sewage treatment facilities will not be completed by 1975.

PB-233 188/2GA PC$7.25/MF$1.45
International Joint Commission-United States and Canada. Great Lakes Water Quality Board.
GREAT LAKES WATER QUALITY - ANNUAL REPORT 1972.
Annual rept. no. 1, 15 Apr 72-Apr 73.
Apr 73, 315p* IJC/DOS-7402
See also report dated Apr 74, PB-233 187.

Descriptors: *Water pollution abatement, *Great Lakes, Legislation, Policies, Sewage, Construction, Industrial wastes, Contaminants, Toxicity, Combined sewers, Metals, Biochemical oxygen demand, Chemical properties, United States, Canada.
Identifiers: *Water quality data, Tributaries.

The report is the first annual report of the Great Lakes Water Quality Board to the International Joint Commission pursuant to the Great Lakes Water Quality Agreement between the United States and Canada signed on April 15, 1972. The report is intended to present a current assessment of water quality in the boundary waters of the Great Lakes and of the control programs and other measures set forth in the Agreement.

PB-233 189/0GA PC$3.25/MF$1.45
International Joint Commission-United States and Canada.
GREAT LAKES WATER QUALITY.
Annual rept. no. 1 for 1972.
1972, 32p* IJC/DOS-7403
See also report dated Apr 74, PB-233 187.

Descriptors: *Water pollution abatement, *Great Lakes, Water quality, Organizations, Industrial wastes, Dredging, Contaminants, Ships, Hazards, Objectives, Reviews, Sewage.
Identifiers: Eutrophication.

The report is the first Annual Report of the International Joint Commission pursuant to the Great Lakes Water Quality Agreement between the United States and Canada signed April 15, 1972. The Commission's report takes cognizance of significant developments through mid-1973, but is based for the most part on data available in April 1973 report of the Great Lakes Water Quality Board.

PB-233 242/7GA PC$3.25/MF$1.45
Northeastern Illinois Planning Commission, Chicago.
FORECAST DECISIONS FACING THE CHICAGO-NORTHWESTERN INDIANA STANDARD CONSOLIDATED AREA 1972-2020.
Final rept.
May 73, 36p NIPC-0273-01-0573

Descriptors: *Regional development, *Illinois, *Indiana, Population forecasting, Employment projections, Methodology, Regional planning.
Identifiers: Alternatives, *Chicago(Illinos).

Using a combination of staff work, assistance from a group of outside experts, and public participation, the Interstate Planning Committee has adopted a regional forecast of Chicago and Indiana population and employment for the year 2020 which is not only felt to be a desirable figure but is also believed to be a realistic one. A set of alternative population and employment forecasts has been prepared, each forecast using a different permutation of a set of assumptions. The report discusses these alternative forecasts.

PB-233 243/5GA PC$5.00/MF$1.45
Northeastern Illinois Planning Commission, Chicago.
SUBURBAN FACTBOOK, 1973.
Final rept.
Aug 73, 165p NIPC-0004-04-0973

Descriptors: *Regional planning, *Illinois, *Socioeconomic profiles, Demographic surveys, Census tabulations, Counties, Municipalities, Political objectives, Economic surveys, Industrial relations.
Identifiers: Townships.

A compendium of Illinois census and non-census data, containing 50 tables is presented. The final edition replaces a preliminary edition published in 1971. Data are presented for counties, townships and municipalities on a wide variety of demographic, economic, social and political subjects. Extensive notes and an index are two new features of the edition.

PB-233 246/8GA PC$7.50/MF$1.45
Peat, Marwick, Mitchell and Co., Washington, D.C.
CONCEPTUAL DESIGN FOR AN URBAN TRANSPORTATION PLANNING INFORMATION SYSTEM.
Final rept.,
R. D. Worrall, S. H. Brounstein, and R. W. Whitaker. Jan 73, 337p* DOT-FH-7826-1
Contract DOT-FH-7826

Descriptors: *Transportation planning, *Urban information systems, *Urban transportation, Concepts, Design criteria, Municipalities, Operations research, Utilization, Data acquisition, Computer programming.

The report outlines a generalized conceptual design for an information system designed to service the continuing urban transportation planning process. It focuses particularly on the surveillance requirements of a continuing operations plan and on the development of a system design appropriate to the resources of a typical transportation planning agency in an area of 50,000 - 500,000 population. Particular emphasis is placed on effective use of the data derived from existing local agency operating and administrative records.

PB-233 252/6GA PC$4.75/MF$1.45
Los Alamos Scientific Lab., N.Mex.
AIR POLLUTION TRANSPORT IN STREET CANYONS.
Final rept.,
R. S. Hotchkiss, and F. H. Harlow. Jun 73, 128p*
EPA-R4-73-029
Contract EPA-IAG-0122(D)

Descriptors: *Air pollution, *Atmospheric motion, *Streets, Mathematical models, Three demensional flow, Turbulent diffusion, Buildings, Exhaust gases, Convection, Fumes, Navier-Stokes equations, Urban areas, Missouri.
Identifiers: Saint Louis(Missouri).

The project was conducted to demonstrate the applicability of numerically modeling the transport of pollution in street canyons. The numerical model employs the solutions of the fully nonlinear, three-dimensional Navier-Stokes equations along with a transport equation for pollutants, for regions of space in which obstacles or buildings cause strong distortions in the flow fields. The numerical technique is used to model three-dimensional flows for which some experimental data have been obtained. This includes calculating the distribution of pollutants in the Broadway Street Canyon in downtown St. Louis, Missouri. Also, the numerical method is used to calculate pollutant distributions in a non-specific street canyon; that is, a street canyon in which the geometry and other important non-dimensional flow parameters give rise to solutions that are applicable, in a general sense, to a variety of street canyons. (Modified author abstract)

PB-233 256/7GA PC$5.00/MF$1.45
PEDCo-Environmental Specialists, Inc., Cincinnati, Ohio.
INVESTIGATION OF FUGITIVE DUST. VOLUME II. CONTROL STRATEGY AND REGULATORY APPROACH.
Final rept.,
George Jutze, and Kenneth Axetell. Jun 74, 40p
EPA-450/3-74-036b

Contract EPA-02-0044

Descriptors: *Air pollution control, *Dust, Particles, Sources, Roads, Agriculture, Standards, Regulations, Test methods, Construction, Sampling, California, Arizona, New Mexico, Texas, Nevada.
Identifiers: Air quality data.

The study involved the combining of selected control techniques for different fugitive dust sources into comprehensive control strategies, and the testing of alternative strategies in attempting to demonstrate achievement of air quality standards in each air quality control region. Predicted reductions in emissions from use of control techniques were compared with reductions in ambient particulate concentrations necessary to reach the standards. The procedures and results of this control strategy testing are presented in this report. In addition, a series of example regulations for the control of various fugitive dust sources are included.

PB-233 291/4GA PC$7.50/MF$1.45
Connecticut Dept. of Community Affairs, Hartford.
A SELECTED COMPILATION OF CONNECTICUT LAWS CONCERNING PLANNING AND ZONING.
Community development aid no. 6 (Final).
1974, 87p DCA-74-17

Descriptors: *Regional planning, *Law(Jurisprudence), *Connecticut, Statutes, Ordinances, Land use zoning, Regulations, Boundaries, Municipalities, Community projects, Licenses, Capital improvement programs, Sales, Highways, Parks, Urban renewal.

The community development aid contains a selected compilation of Connecticut General Statutes and Public Acts pertaining to Planning and Zoning. This publication is an updating of CDA No. 6 published first in 1972 and includes changes in the General Statutes resulting from the passage of Public Acts during the 1972 Special Session and the 1973 Regular Session and the 1973 Regular Session of the Connecticut General Assembly.

PB-233 292/2GA PC$7.50/MF$1.45
Mueser, Rutledge, Wentworth and Johnston, New York.
SUBSURFACE INVESTIGATION, SECTION F003, BRANCH ROUTE.
rept. no. 11.
26 Jun 74, 86p MRWJ-74-110

Descriptors: *Rapid transit railways, *Subsurface investigations, *Borings, *Pumping, *District of Columbia, Urban transportation, Geologic structures, Foundations, Subsoil, Water level, Soil properties, Water wells.

Results are summarized of eleven supplementary test borings and a pumping test made for the investigation of subsurface conditions along M Street and in the Washington Naval Shipyard in Section F003 of Branch Route. The report contains geological sections which summarize information from the supplementary test borings, sections at natural scale which show the drawdown achieved in the pumping test, observations of water levels and pumping rate at the test well, and results of laboratory tests performed on samples recovered. The text describes the pumping test and conclusions drawn from it, and discusses certain design and construction problems.

PB-233 363/1GA PC$6.50/MF$1.45
Cambridge Collaborative, Inc., Mass.
PREDICTION AND CONTROL OF RAIL TRANSIT NOISE AND VIBRATION - A STATE-OF-THE-ART ASSESSMENT.
Interim rept. Jul-Dec 73,
J. E. Manning, R. G. Cann, and J. J. Fredberg. Apr 74, 252p* UMTA-MA-06-0025-74-5, DOT-TSC-UMTA-74-6
Contract DOT-TSC-643

Descriptors: *Rapid transit railways, *Noise reduction, *Vibration, Reviews, Urban transportation, Railroad tracks, Subway railways, Sound transmission, Damping, Roadbeds, Railroad tunnels, Acoustic absorption, Mass transportation.

The report contains results of a review of current technology for the prediction and control of urban rail transit noise and vibration, with primary emphasis on the parameters affecting propagation paths. Included are tools for the prediction of wayside noise and vibration adjacent to both at-grade and elevated transit track, groundborne noise propagation from subway tunnels, and noise in cars and in stations. In addition, several noise and vibration control techniques are evaluated including resilient rail fasteners, floating slabs, noise barriers, elevated structure enclosures, structural damping, and acoustical treatment of stations and tunnels.

SLA-74-220 PC$4.00/MF$1.45
Sandia Labs., Albuquerque, N.Mex. (Usa).
SANDIA LABORATORIES AIR POLLUTION SAMPLING PROGRAM.
L. W. Brewer. 1 Apr 74, 18p CONF-740406-3

Descriptors: (*New mexico, *Surface air), (*Air pollution, *Monitoring), Abundance, Aerosol monitoring, Carbon monoxide, Data, Earth atmosphere, Hydrocarbons, Nitrogen oxides, Particles, Sampling, Sulfur oxides.

For abstract, see NSA 30 01, number 00333.

TT-73-54034 PC$6.00
Department of Housing and Urban Development, Washington, D.C. Office of International Affairs.
TOWN IN THE MAKING,
Kazimierz Wejchert. 1974, 237p
Trans. of mono. Miasto na Warsztacie, Warsaw. 1969 280p, by Antoni Wask. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: *Urban development, *Poland, *New community development, Urban planning, Social organization, Reviews, Environmental engineering, Translations.
Identifiers: New town planning.

The book reviews sociological investigations undertaken during 1960-1965 in a new town Tychy, since 1950 under construction in Poland's upper Silesian industrial region.

13C. Construction Equipment Materials, and Supplies

AD-780 674/8GA PC$16.00/MF$1.45
Defense Supply Agency Alexandria Va Office of the Assistant Director Plans Programs and Systems
CONSTRUCTION/ENGINEER EQUIPMENT MAINTENANCE STUDY (CEEMS). VOLUME I. ANALYSIS OF CONSTRUCTION/ENGINEER EQUIPMENT MAINTENANCE.
Oct 73, 259p
See also Volume 2, AD-780 675.

Descriptors: *Military equipment, *Construction equipment, *Maintenance, Inventory analysis, Maintainability, Life expectancy, Depots, Logistics support, Cost analysis.

A definitive study plan, distributed to the Assistant Secretaries (Installations and Logistics) of the Army, Navy and Air Force, and to the Director of the Defense Supply Agency, by an ASD(I and L) memorandum dated 9 December 1971 delineated the following major study objectives: evaluate the current systems for performing major maintenance/rebuild of construction/engineer equipment, and develop recommendations for improvements where required; analyze alternate policies and systems for improving the accomplishment of the maintenance/rebuild of construction/engineer equipment, and determine their feasibility in terms of responsiveness to operational requirements and costs; determine the potential for consolidating construction/engineer equipment major maintenance functions and/or facilities within the DoD, and evaluate the feasibility and practicality of adopting such action(s). This two volume Report documents the findings from Service and Agency briefing, extensive on-site research at a wide variety of activities, and a comprehensive data call and presents the analyses, conclusions, and recommendations of the study.

AD-780 675/5GA PC$13.00/MF$1.45
Defense Supply Agency Alexandria Va Office of the Assistant Director Plans Programs and Systems
CONSTRUCTION/ENGINEER EQUIPMENT MAINTENANCE STUDY (CEEMS). VOLUME II. BASIC CONSTRUCTION/ENGINEER MAINTENANCE SYSTEMS.
Oct 73, 198p
See also Volume 1, AD-780 674.

Descriptors: *Military equipment, *Construction equipment, *Maintenance, Inventory analysis, Maintainability, Life expectancy, Depots, Logistics support, Cost analysis.

In a Memorandum dated 4 November 1971, the Assistant Secretary of Defense (Installations and Logistics) directed that the Defense Supply Agency Analysis Division conduct a special comprehensive review to assess, on a DoD-wide basis, the effectiveness and cost of present policies and practices for providing major maintenance support and rebuild for construction/engineer equipment. This two volume Report documents the findings from Service and Agency briefings, extensive on-site research at a wide variety of activities, and a comprehensive data call and presents the analyses, conclusions, and recommendations of the Study.

AD-780 828/0GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
SOME MECHANICAL PROPERTIES OF POLYMER CEMENT CONCRETE EXPOSED TO INFRARED RADIATION,
R. S. Podagel, and A. P. Kudzis. 5 Jun 74, 13p Rept no. FTD-HC-23-1961-74
Edited trans. of Zhelezobetonnye Konstruktsii. Trudy Bilnyusskogo Inzhenerno-Stroitelnogo Instituta n5 p211-219 1973 (Sic).

Descriptors: *Hardening, *Infrared radiation, Translations, USSR.
Identifiers: *Polymer concretes, *Setting time, Infrared heating.

Infrared irradiation is an effective means of intensifying the hardening process of polymer cement concrete, and makes it possible to obtain a high-quality concrete of tempered strength. The rate of the temperature rise has a great effect on the strength of the concrete immediately after its irradiation and has practically no effect on its strength after aging for 28 days. The length of irradiation has an opposite effect.

AD-780 858/7GA PC$3.75/MF$1.45
Army Engineer District Portland Oreg
ROLLER COMPACTED CONCRETE STUDIES AT LOST CREEK DAM.
Final rept.,
Donald J. Hall, and Donald L. Houghton. Jun 74, 56p

Descriptors: *Concrete, *Compacting, *Rollers, Vibrators(Machinery), Formulations, Test methods, Fly ash, Shale, Dams, Oregon.
Identifiers: Lost Creek Dam.

At Lost Creek Dam at Trail, Oregon, lean 3-inch maximum size aggregate (MSA) concrete mixtures were designed to be compacted by vibratory rollers. The control mix contained 235 pounds cement per cubic yard while other mixtures had a portion of the total volume of cement replaced with pozzolan, either fly ash or a locally available calcined shale. Each layer, except bedding layers, was approximately 8-inches thick after compaction. Laboratory work on control testing was conducted. It was concluded that properly proportioned roller compacted concrete can be effectively placed by soils compaction methods using a vibratory roller. The results of tests on drilled core specimens indicate that permeability and bond test results are similar to conventionally placed lean mass concrete values. The quality of the hardened lift joint is improved with the use of bedding mixtures. A modified Vebe apparatus can be used for control testing and for molding concrete central cylinders. (Modified author abstract)

AD-781 023/7GA PC$4.00/MF$1.45
Army Foreign Science and Technology Center Charlottesville Va
FRG (FEDERAL REPUBLIC OF GERMANY) AND JAPANESE CEMENT MIXER VEHICLES,
T. Filyagina. 9 Aug 73, 9p Rept no. FSTC-HT-23-971-73
Trans. of Stroitelnye i Dorozhnye Mashiny (USSR) n4 p25-26 1972.

Descriptors: *Construction equipment, *Vehicles, Cements, Mixing, Production, Japan, West Germany, USSR, Translations.

The article discusses various types of cement mixer vehicles manufactured in the Federal Republic of Germany and in Japan. Particular attention is paid to mixing drum drive mechanisms. Vehicles using power by separate engine and by vehicle engine are discussed as are separate methods of using power take-off from the vehicle engine. The article includes tables of technical characteristics for several vehicles.

AD-781 169/8GA PC$4.00/MF$1.45
Army Foreign Science and Technology Center Charlottesville Va
DETERMINATION OF OPTIMAL VEHICLE SERVICE LIFE BEFORE MAJOR OVERHAUL,
E. Indikt, and V. Lyubimova. 1 Apr 74, 12p Rept no. FSTC-HT-23-1575-73
Trans. of Avtomobilnyi Transport (USSR) n3 p33-36 1972.

Descriptors: *Trucks, Life expectancy, Maintenance, Translations, USSR.
Identifiers: Dump trucks.

The report presents calculations of optimal vehicle service life before a major overhaul, based on analysis of all expenditure items per 10 ton-km from results of operational tests of an experimental lot -- 40 1965 model dump trucks. All the dump trucks operated as part of a truck train with a load capacity of 8.5 tons in hauling loose construction loads in Moscow.

PB-233 269/0GA PC$7.00/MF$1.45
Mississippi State Highway Dept., Jackson. Research and Development Div.
A STUDY OF CONCRETE SLAB JACKING SLURRIES.
Interim rept. on phase I,
J. Doyle Webb. Sep 73, 77p MSHD-RD-73-058-1

Descriptors: *Concrete pavements, *Slurries, *Pressure grouting, Sand, Calcium chlorides, Water, Formulations, Maintenance, Roads.

The purpose of this project is to determine the best slab jacking slurry mixes and methods of application to be used in adjusting, reseating and stabilizing portland cement concrete pavements. Pressure grouting is an excellent means of stabilizing old slabs before the roadway is upgraded by widening and overlaying provided the proper controls and techniques are used. A gradation for five sand content was established. Calcium chloride contents for specific temperature ranges were developed. The batching procedure for best results was determined.

13D. Containers and Packaging

AD-781 025/2GA PC$4.75/MF$1.45
Army Foreign Science and Technology Center Charlottesville Va
ECONOMIC EFFECTIVENESS OF THE APPLICATION OF LARGE-CAPACITY CONTAINERS FOR MARINE TRANSPORT,
I. A. Grabarnik. 8 May 74, 35p Rept no. FSTC-HT-23-2397-72
Trans. of Ekonomika i Ekspluatatsiya Morskogo Transporta (USSR) n24(30) p19-43 1969.

Descriptors: *Containers, *Marine transportation, Containerizing, Materials handling vehicles, Rail transportation, Shipping containers, USSR, Translations.

Successful development of cargo shipment and the introduction of large capacity containers to mixed rail and marine transport is examined. One of the conclusions drawn from this study is that of achieving the greatest effectiveness of transportation of piece goods by using universal containers, particularly those weighing 10 and 20 tons gross.

13E. Couplings, Fittings, Fasteners, and Joints

JUL-1011-RW PC$8.25/MF$1.45
Kernforschungsanlage Juelich G.M.B.H. (F.R. Germany). Inst. Fuer Reaktorwerkstoffe.
WELDED JOINTS BETWEEN DIFFERENT MATERIALS, ILLUSTRATED BY THE EXAMPLE OF MATERIAL COMBINATIONS OF INTEREST IN NUCLEAR SCIENCE AND TECHNOLOGY.
G. Metzger, and R. Lison. Oct 73, 124p
In German.

Descriptors: (*Silver, *Welded joints), (*Aluminium, Welded joints), (*Copper, Welded joints), (*Copper base alloys, Welded joints), Nickel alloys, Chromium-nickel steels.

For abstract, see NSA 30 01, number 00850.

N74-22203/5GA PC$9.00/MF$1.45
Martin Marietta Corp., Denver, Colo.
DISSIMILAR METALS JOINT EVALUATION.
Final Report.
M. E. Wakefield, and L. E. Apodaca. Apr 74, 120p
NASA-CR-134249, MCR-74-88
Contract NAS9-13570

Descriptors: *Metal joints, *Pipes (Tubes), *Weld strength, *Weld tests, *Welded joints, Aluminum alloys, Mechanical properties, Metal working, Stainless steels.

For abstract, see STAR 1213

PTB-ME-4 PC$7.50/MF$1.45
Physikalisch-Technische Bundesanstalt, Braunschweig (F.R. Germany).
DETERMINATION OF PITCH OF SCREW THREADS. PART I.
M. Kochsiek, and J. Lerch. Feb 74, 89p
In German.

Descriptors: (*Fasteners, *Design).

For abstract, see NSA 30 01, number 02402.

13F. Ground Transportation Equipment

AD-780 586/4GA PC$3.75/MF$1.45
Air Force Special Weapons Center Kirtland AFB N Mex
NUCLEAR SAFETY EVALUATION TESTING OF THE AERO 51B TRAILER/MHU-71/E RAIL SET FOR THE AGM-69 (SRAM) SYSTEM.
Final rept. Feb-Jul 73,
Frank T. Krek. Apr 74, 66p Rept no. AFSWC-TR-73-31

Descriptors: *Trailers, *Safety, *Air to surface missiles, *Land transportation, Reliability, Rails, Nuclear warheads, Road tests.
Identifiers: AGM-69A missiles, Aero 51B trailers, MHU-71E rail sets.

Nuclear safety evaluation tests were performed on an Aero 51B Munitions Handling Trailer and MHU-71/E Missile Handling Rail Set combination. The trailer was towed singly and configured for transporting AGM-69 (SRAM) system components. As a result of testing, it is recommended that the Aero 51 B Munitions Handling Trailer be nuclear safety certified for use with the AGM-69 (SRAM) system when incorporated with the MHU-71/E Guided Missile Handling Rail Sets. The test procedures, test data, notation of test observations, and other pertinent information are presented. (Author)

AD-780 737/3GA PC$3.00/MF$1.45
Army Land Warfare Lab Aberdeen Proving Ground Md
SCRATCH RESISTANT PLASTIC WINDOWS FOR M151 TRUCK.
Final rept.,
Robert P. McGowan. Mar 74, 19p Rept no. LWL-TR-74-14

Descriptors: *Trucks, *Windows, *Plastics, Reliability, Silicones, Coatings, Visibility, Road tests, Optical properties, Costs, Acrylic resins, Polycarbonates, Military vehicles.
Identifiers: M-151 trucks(1/4 Ton), *Scratch resistant plastics.

Tests were conducted with scratch resistant plastic window material installed in military vehicle canvas soft-tops in place of the vinyl plastic material in current standard use. The silicone-coated material retained optical clarity in service conditions which included operations over dusty roads and daily washing. The test material was far superior to the vinyl material which degrades optically due to wrinkling, scratching or hazing, and discoloration. The test material is more costly, but this may be offset by increased service life. (Author)

AD-780 740/7GA PC$3.75/MF$1.45
Army Land Warfare Lab Aberdeen Proving Ground Md
ENGINEER TEST AND USER EVALUATION OF UNA-TRACK KIT.
Final rept.,
Joseph T. Gurganious. May 74, 57p Rept no. LWL-TR-74-26

Descriptors: *Military vehicles, *Vehicle tracks, *Kits, Replacement, Vehicle wheels, Mobility, Arctic regions, Road tests.
Identifiers: M-151 trucks(1/4-ton), M-175 trucks(1 1/4-ton), M-725 trucks(1 1/4-ton), *Unatrack kits.

The UNA-Track Kit consists of four independent track assemblies which mount directly to the hubs of existing 4-wheel drive vehicles. The tracks replace the wheels on a one-for-one basis; no vehicle modifications are required. UNA-Track Kits were mounted on the 1/4-ton M151 and 1 1/4-ton M715/725 trucks and tested to determine the mo-

bility in an arctic environment. The UNA-Track did significantly improve the mobility of the 1/4-ton M151, and the 1 1/4-ton M715/725, but power steering and other steering system modifications would be required. (Modified author abstract)

AD-780 994/0GA PC$4.00/MF$1.45
Army Foreign Science and Technology Center Charlottesville Va
METHOD OF ANALYSIS OF ACCELERATIONS AND SMOOTHNESS OF RIDE OF A MOTOR VEHICLE,
V. B. Tsimbalin, V. V. Gnetnev, and L. N. Orlov.
26 Apr 74, 6p Rept no. FSTC-HT-23-2224-72
Trans. of Avtomobilnyi Transport (USSR) n10 p13 1971.

Descriptors: *Trucks, Acceleration, Roughness, Translations, USSR.
Identifiers: *Ride quality.

Results of investigations on the analysis of accelerations and increasing ride smoothness of trucks are described. The mean square value of accelerations with the predominant number of oscillations at 4 - 6 Hz must be half the accelerations centered at 2 - 3 Hz for self-powered chassis and other machines. Coefficients are recommended to adjust estimates of the influence of oscillations as a function of frequency.

AD-781 007/0GA PC$5.50/MF$1.45
Iowa Univ Iowa City Dept of Mechanics and Hydraulics
OPTIMIZATION OF DYNAMIC RESPONSE OF COMPLEX VEHICULAR STRUCTURES.
Technical rept.,
Jasbir S. Arora, and M. H. Hsiao. Jun 73, 50p Rept no. THEMIS-UI-48
Contract DAAF03-69-C-0014
Report on Vibration and Stability of Military and Other Complex Vehicular Systems.

Descriptors: *Vehicle chassis components, *Dynamic response, Steepest descent method, Degrees of freedom, Damping, Vibration, Mathematical models, Computer programs.
Identifiers: Two degrees of freedom.

In this report, optimum design of the dynamic response of vehicular structures is considered. A generalized steepest descent method is developed which integrates the equations of motion of the system quite nicely. The general theory developed is then applied to a two degrees of freedom model with damping. The objective function for the problem consists of peak velocities and accelerations during a specified time interval. Since analytic solutions of equations of motion are not known, an expression for a peak response cannot be written in terms of the design variables. So, the maximum values of various functions are expressed as norms in the Lp space. Two techniques of expressing the constraints on the response quantities are tried. In the first technique, these constraints are expressed in terms of norms in the Lp space. This representation did not work very well because the rate of convergence of Lp norms was quite slow. In the second technique, the bounds on the response quantities are treated as functional constraints. This formulation worked quite satisfactorily and the results obtained for it are presented and discussed. (Author)

AD-781 022/9GA PC$4.00/MF$1.45
Army Foreign Science and Technology Center Charlottesville Va
UAZ-469 REPLACES GAZ-69,
Z. Stilbans. 14 May 74, 5p Rept no. FSTC-HT-23-1510-73
Trans. of Za Rulem (USSR) n12 p12 1972, by James McVay.

Descriptors: *Vehicles, Passenger vehicles, Mobility, USSR, Translations.

The translation briefly discusses the characteristics and capabilities of the passenger vehicle UAZ 469 and trucks UAZ 452.

N74-22587/1GA PC$8.00/MF$1.45
Stanford Research Inst., Menlo Park, Calif.
TECHNOLOGY TRANSFER: TRANSPORTATION.
Annual Report, 15 Aug. 1972 - 15 Aug. 1973.
T. Anyos, R. Lizak, and D. Merrifield. Sep 73, 99p NASA-CR-138180
Contracts NASW-2455, SRI PROJ. PYU-2201

Descriptors: *Nasa programs, *Technology transfer, *Transportation, Highways, Rail transportation, Rapid transit systems, Systems engineering.

For abstract, see STAR 1213

PATENT-3 791 433 Not available NTIS
Department of the Air Force Washington D C
FILAMENT-WOUND, TOROIDAL TIRE WITH PNEUMATIC RIM-LOCKING TUBE.
Patent,
Howell K. Brewer. Filed 13 Jul 72, patented 12 Feb 74, 4p Rept nos. PAT-APPL-271 467,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Tires, *Tire tubes, *Patents, Inflatable structures, Locking(Mechanics), Inflating, Filament wound construction.
Identifiers: PAT-CL-152-339.

The patent relates to a closed membrane, toroidal tire having a cord reinforced rubber tube positioned within the tire casing, and inflatable for automatically urging the inner casing portion in the locking relation against the rim of an aircraft or other vehicular wheel on which it is mounted.

PB-232 718/7GA PC$3.20/MF$1.45
Transportation Research Board, Washington, D.C.
CENSUS DATA AND URBAN TRANSPORTATION PLANNING, PROCEEDINGS OF A CONFERENCE HELD IN ALBUQUERQUE, NEW MEXICO, ON AUGUST 21-23, 1973.
Special rept.,
Paul T. Manka. 1974, 97p* TRB-SR-74-145, ISBN-0-309-02276-2
Library of Congress Catalog Card no. 74-7863.

Descriptors: *Urban transportation, *Vehicular traffic, *Census tabulations, *Meetings, Urban areas, Urban planning.

The document presents the report of a committee project on concepts and procedures used in preparing the 1970-Census Urban Transportation Planning Package, experiences in using the package, and directions for the 1980 census.

PB-232 812/8GA PC$5.50/MF$1.45
Mueser, Rutledge, Wentworth and Johnston, New York.
SUBSURFACE INVESTIGATION, SECTION G001, ADDISON ROUTE.
Rept. no. 10.
14 Jun 74, 49p MRWJ-74-109

Descriptors: *Subway railways, *District of Columbia, *Routes, *Subsurface investigations, Foundations, Rock mechanics, Soil mechanics, Tunneling(Excavation), Subsurface structures, Boring, Subsoil, Urban transportation, Mass transportation, Urban planning.
Identifiers: Foundation engineering, *Addison Route, Design section G001.

Results are summarized of fourteen supplementary test borings made for the investigation of subsoil conditions for the Washington Metropolitan Area Metro System in Section G001 of Addison Route, extending generally along Benning Road in the eastern corner of the District of Columbia from its intersection with the Anacostia Freeway to Central Avenue. The report contains a continuous longitudinal geological section along the line of the subway which incorporates the boring information, the logs of supplementary test borings, results of tests performed on samples recovered and a text summarizing anticipated design and construction problems.

PB-232 835/9GA PC$4.75/MF$1.45
Mueser, Rutledge, Wentworth and Johnston, New York.
SUBSURFACE INVESTIGATION, SECTION E001, GREENBELT ROUTE.
Rept. no. 9.
7 Jun 74, 32p MRWJ-74-107

Descriptors: *Subway railways, *District of Columbia, *Routes, *Subsurface investigations, Foundations, Rock mechanics, Soil mechanics, Tunneling(Excavation), Subsurface structures, Boring, Subsoil, Urban transportation, Mass transportation, Urban planning.
Identifiers: Foundation engineering, *Greenbelt Route, Design section E001.

Results are summarized of seventeen supplementary test borings made to investigate conditions along the line of tunnels and two planned cut-and-cover stations on 7th Street N.W. between H Street and U Street in Section E001 of the Greenbelt Route of the Washington Metropolitan Area Metro System. The report contains a continuous longitudinal geological section along the subway line, logs of the test borings, results of laboratory tests performed on samples obtained and a text summarizing anticipated design and construction problems.

PB-232 940/7GA PC$5.75/MF$1.45
Transport and Road Research Lab., Crowthorne (England).
AN ANALYSIS OF SOME WORLD TRANSPORT STATIS
A. H. Tulpule. 1974, 51p TRRL-LR-622

Descriptors: *Passenger transportation, *Cargo transportation, Great Britain, Highway transportation, Marine transportation, Air transportation, Tables(Data), Europe, North America, South America, Asia, Africa, USSR, Research.

The main purpose of the report is to present a broad picture of trends in world passenger and goods transport by mechanical means since 1950. Estimates of passenger kilometers and ton-kilometers by road for each region are made and the trends in road transport are compared with trends in transport by rail, air and sea. The report also gives an indication of possible future growth in world transport on the basis of past trends and assumptions about future developments.

PB-232 953/0GA PC$3.00/MF$1.45
Transportation Systems Center, Cambridge, Mass.
AVAILABILITY ANALYSIS OF DUAL MODE SYSTEMS.
Final rept. Sep 73-Mar 74,
Charles R. Toye. Apr 74, 25p DOT-TSC-UMTA-74-4 UMTA-MA-06-0029-74-1

Descriptors: *Urban transportation, Availability, Monte Carlo method, Reliability, Simulation.
Identifiers: *Dual mode transportation systems.

The analytical procedures presented define a method of evaluating the effects of failures in a complex dual mode transportation system based on a 'worst' case steady state analysis. The computed result is an availability figure of merit and not an absolute prediction with associated confidence levels of system availability. The advantage of this procedure is that it avoids the use of a dynamic network traffic flow simulation which is both costly and time-consuming.

PB-232 970/4GA PC$3.25/MF$1.45
Mitre Corp., McLean, Va.
DEMAND-RESPONSIVE TRANSPORTATION SYSTEM PLANNING GUIDELINES,
Bert Arrillaga, and George E. Mouchahoir. Apr 74, 47p MTR-6659 UMTA-VA-06-0012-74-6
Contract DOT-UT-10028

Descriptors: *Urban transportation, *Management analysis, *Dial a ride systems, Reviews, Instructions, Services, Operations, Financing, Economic factors.
Identifiers: *Demand responsive transportation systems.

Based on the limited empirical information of 12 demand-responsive transportation systems, preliminary planning guidelines have been developed to aid in the design of new demand-responsive systems. These guidelines facilitate the estimation of ridership, fleet size, staff requirement and costs. A summary is also presented of the major characteristics of these 12 demand-responsive systems that are operating in the United States and Canada. The summary illustrates the types of systems that have been recently implemented. They include many-to-many, many-to-few, many-to-one and route deviation systems.

PB-233 016/5GA PC$6.00/MF$1.45
Battelle Columbus Labs., Ohio.
ASSESSMENT OF DESIGN TOOLS AND CRITERIA FOR URBAN RAIL TRACK STRUCTURES. VOLUME I. AT-GRADE TIE-BALLAST TRACK.
Final rept. Mar 73-Mar 74,
Robert H. Prause, and Howard C. Meacham. Apr 74, 247p* UMTA-MA-06-0025-74-3, DOT-TSC-UMTA-74-5-Vol-1
Contract DOT-TSC-563
See also Volume 2, PB-233 017.

Descriptors: *Rapid transit railways, *Railroad tracks, Rail transportation, Design criteria, Railroad ties, Railroad ballast, Defects, Foundations, Anchors(Structures).

The report presents the results of a critical review of the technical factors which govern the design and performance of at-grade tie-ballast track for urban rail systems. The assessment of current design practice is based on a review of the literature and discussions with experienced track design personnel. The evaluation includes design loads and the criteria for selecting rail size, tie size and spacing, ballast depth, and subgrade parameters. The major track problems identified were rail joints, rail wear and noise on curves, rail fasteners, and rail corrugation. Detailed technical evaluations were made to determine those areas where the track design procedures are inadequate. The report includes detailed information for the engineering design of track and recommendations for both short and long-range program plans for future research pertaining to the improvement of track performance.

PB-233 017/3GA PC$4.50/MF$1.45
Battelle Columbus Labs., Ohio.
ASSESSMENT OF DESIGN TOOLS AND CRITERIA FOR URBAN RAIL TRACK STRUCTURES. VOLUME II. AT-GRADE SLAB TRACK.
Final rept. Mar 73-Mar 74,
Howard C. Meacham, Robert H. Prause, and John Waddell. Apr 74, 101p* UMTA-MA-06-0025-74-4, DOT-TSC-UMTA-74-5-Vol-2
Contract DOT-TSC-563
See also Volume 1, PB-233 016.

Descriptors: *Rapid transit railways, *Railroad tracks, Rail transportation, Design criteria, Railroad ties, Railroad ballast, Defects, Foundations, Anchors(Structures).
Identifiers: Finite element analysis.

This report presents the results of a critical review of the technical factors which govern the design and performance of at-grade slab track for urban rail systems. The assessment of current design practices is based on a review of the literature and discussions with experienced track design personnel. The evaluation includes descriptions of slab structures now in use in four countries, followed by review of design and analysis procedures used to characterize the subgrade and its support characteristics; the reinforced concrete slab itself, and the subgrade-support system. With a few exceptions, most of the work reported in the literature is based on highway or runway applications, where the mechanism of load transfer into the slab is completely different than in a rail support slab. Further research on the mechanisms of load transfer from rail fasteners into a reinforced concrete slab is needed, and the newly developed finite element approach appears well-suited.

PB-233 064/5GA PC$5.75/MF$1.45
Federal Railroad Administration, Washington, D.C. Office of Research, Development and Demonstrations.
HIGH SPEED GROUND TRANSPORTATION ACT OF 1965 AND THE RAILROAD TECHNOLOGY PROGRAM 1973.
Annual rept. no 7, Oct 72-Sep 73.
1973, 205p* FRA-ORD/D-74-54
See also report dated Sep 72, PB-222 261.

Descriptors: *Rapid transit railways, *Railroads, *Passenger transportation, Research, Technical reports, Legislation, Railroad transportation, Railroad tracks, Railroad trains, Safety engineering, Traffic control, Freight cars, Dynamics, Propulsion, Control.
Identifiers: Metroliners, Turbotrains, *High speed ground transportation.

The report presents studies on rail technology, such as improved passenger and freight service, safety research, improved track, rail and vehicle dynamics. The study evaluates the Washington-New York Metroliner and the Boston-New York Turbotrain Demonstration including ridership and mileage. The report also presents research on advanced systems such as tracked levitated, magnetically levitated, and tracked air cushion vehicle systems along with supporting technology, such as propulsion, communications and control, guideways and tunneling.

PB-233 129/6GA PC$10.75/MF$1.45
Ultrasystems, Inc., Phoenix, Ariz. Dynamic Science Div.
VEHICLE FRONT END STRUCTURE CRASH EVALUATION PROGRAM. VOLUME III. APPENDICES.
Final rept. Jul 72-Dec 73,
L. Maurice Shaw, Allen D. Harper, and Robert L. Anderson. May 74, 557p Dynamic Science-2310-73-160 DOT-HS-801-130
Contract DOT-HS-046-2-486
See also Volume 2, PB-232 652.

Descriptors: *Automobiles, *Crash tests, *Structural design, *Safety engineering, Bumpers, Automobile bodies, Structural properties, Acceleration, Impact tests, Computerized simulation.
Identifiers: *Crashworthiness.

The report presents the results of a research program conducted to determine the crash response characteristics of two front end structure systems. Computer simulations of each structure and crash environment were conducted using an existing computer crash simulation program. The two front end structures, a ramped fixed-force system and a variable stroke velocity-sensitive system, were incorporated into bogey vehicles which were crashed into a rigid barrier, a variable rigidity barrier, and production vehicle front and side structures. The test results provided data by which computer simulation of the crash conditions was verified, providing a high degree of confidence in analytical representation.

PB-233 150/2GA PC$10.00/MF$1.45
National Highway Traffic Safety Administration, Washington, D.C. General Services Div.
MOTOR VEHICLE SAFETY DEFECT RECALL CAMPAIGNS-DETAILED REPORTS FROM JANUARY 1 TO MARCH 31, 1974.
Apr 74, 511p DOT-HS-801 147
Portions of this document are not fully legible.

Descriptors: *Motor vehicles, *Defects, *Reclamation, *Safety engineering, *Passenger vehicles, Manufacturers, Failure, Assembling, Safety, Quality control.
Identifiers: *Motor vehicle safety defect recall.

The report presents details of recall campaigns as submitted by vehicle and equipment manufacturers. Portions of this document are not fully legible.

PB-233 192/4GA PC$4.00/MF$1.45
National Scientific Labs., Inc., McLean, Va.
ELECTROMAGNETIC ENVIRONMENT MEASUREMENTS OF PERSONALIZED RAPID TRANSIT SYSTEMS AT 'TRANSPO 72'. VOLUME I.
Final rept. Jan-Sep 72,
Earl E. Jamison. Jan 74, 78p DOT-TSC-UMTA-73-15-Vol-1, UMTA-MA-06-0031-73-Vol-1
Contract DOT-TSC-375
See also Volume 2, PB-233 193.

Descriptors: *Rapid transit railways, *Passenger transportation, *Electromagnetic environments, Urban transportation, Electromagnetic noise, Spectrum signatures, Electromagnetic compatibility, Electromagnetic radiation, Measurement, Extremely low frequency, Very low frequency, Low frequency.
Identifiers: PRT(Personalized Rapid Transit), *Personalized rapid transit.

An X-Y plot is made of the ambient radiated electromagnetic signals and noise between 1KHz and 50KHz at Dulles International Airport for the purpose of assessing the local environment at each of the four Personalized Rapid Transit (PRT) sites prior to operation of each system. A Polaroid scope camera was used in conjunction with a spectrum analyzer to photograph signals between 50KHz and 50MHz. The purpose of the measurements program was to establish some base line information on the electromagnetic signal characteristics in the Dulles area in the event there was an interaction between the PRT Command and Control Systems and the Federal Aviation Administration Air Traffic Control equipment. The measurements obtained during this series of tests will be used for a comparison with data obtained under the same conditions first with each system operating individually and then with all four systems operating simultaneously.

PB-233 193/2GA PC$3.75/MF$1.45
National Scientific Labs., Inc., McLean, Va.
ELECTROMAGNETIC ENVIRONMENT MEASUREMENTS OF PERSONALIZED RAPID TRANSIT SYSTEMS AT 'TRANSPO 72'. VOLUME II. DASHAVEYOR SYSTEM.
Final rept. Jan-Sep 72,
Earl E. Jamison. Jan 74, 59p DOT-TSC-UMTA-73-15-Vol-2, UMTA-MA-06-0031-73-Vol-2
Contract DOT-TSC-375
See also Volume 1, PB-233 192, and Volume 3, PB-233 194.

Descriptors: *Rapid transit railways, *Passenger transportation, *Electromagnetic environments, Urban transportation, Electromagnetic noise, Spectrum signatures, Electromagnetic compatibility, Electromagnetic radiation, Measurement, Extremely low frequency, Very low frequency, Low frequency.
Identifiers: PRT(Personalized Rapid Transit), *Personalized rapid transit.

An X-Y plot is made of the radiated Electromagnetic signals and noise between 1KHz and 50KHz

at each of the four Personalized Rapid Transit (PRT) sites at Dulles International Airport. The PRT systems were operated individually to establish the signal characteristics of each system. A spectrum analyzer was used to view the frequency spectrum broadband prior to recording and a Polaroid scope camera was used in conjunction with the spectrum analyzer to photograph signals between 50KHz and 50MHz. This frequency range was sufficiently broad to cover all command and control frequencies of the four PRT systems.

PB-233 194/0GA PC$3.75/MF$1.45
National Scientific Labs., Inc., McLean, Va.
ELECTRONAGNETIC ENVIRONMENT MEASUREMENTS OF PERSONALIZED RAPID TRANSIT SYSTEMS AT 'TRANSPO 72'. VOLUME III. FORD SYSTEM.
Final rept. Jan-Sep 72,
Earl E. Jamison. Jan 74, 54p DOT-TSC-UMTA-73-15-Vol-3, UMTA-MA-06-0031-73-Vol-3
Contract DOT-TSC-375
See also Volume 2, PB-233 193, and Volume 4, PB-233 195.

Descriptors: *Rapid transit railways, *Passenger transportation, *Electromagnetic environments, Urban transportation, Spectrum signatures, Electromagnetic noise, Electromagnetic compatibility, Electromagnetic radiation, Measurement, Extremely low frequency, Very low frequency, Low frequency.
Identifiers: PRT(Personalized Rapid Transit), *Personalized rapid transit.

An X-Y plot is made of the radiated Electromagnetic signals and noise between 1 KHz and 50KHz at each of the four Personalized Rapid Transit (PRT) sites at Dulles International Airport. The PRT systems were operated individually to establish the signal characteristics of each system. A spectrum analyzer was used to view the frequency spectrum broadband prior to recording and a Polaroid scope camera was used in conjunction with the spectrum analyzer to photograph signals between 50KHz and 50MHz. This frequency range was sufficiently broad to cover all command and control frequencies of the four PRT systems.

PB-233 195/7GA PC$3.75/MF$1.45
National Scientific Labs., Inc., McLean, Va.
ELECTROMAGNETIC ENVIRONMENT MEASUREMENTS OF PERSONALIZED RAPID TRANSIT SYSTEMS AT 'TRANSPO 72'. VOLUME IV. MONOCAB SYSTEM.
Final rept. Jan-Sep 72,
Earl E. Jamison. Jan 74, 54p DOT-TSC-UMTA-73-15-Vol-4, UMTA-MA-06-0031-73-Vol-4
Contract DOT-TSC-375
See also Volume 3, PB-233 194, and Volume 5, PB-233 196.

Descriptors: *Rapid transit railways, *Passenger transportation, *Electromagnetic environments, Urban transportation, Spectrum signatures, Electromagnetic noise, Electromagnetic compatibility, Electromagnetic radiation, Measurement, Extremely low frequency, Very low frequency, Low frequency.
Identifiers: PRT(Personalized Rapid Transit), *Personalized rapid transit.

An X-Y plot is made of the radiated Electromagnetic signals and noise between 1 KHz and 50KHz at each of the four Personalized Rapid Transit (PRT) sites at Dulles International Airport. The PRT systems were operated individually to establish the signal characteristics of each system. A spectrum analyzer was used to view the frequency spectrum broadband prior to recording and a Polaroid scope camera was used in conjunction with the spectrum analyzer to photograph signals between 50KHz and 50MHz. This frequency range was sufficiently broad to cover all command and control frequencies of the four PRT systems.

PB-233 196/5GA PC$3.25/MF$1.45
National Scientific Labs., Inc., McLean, Va.
ELECTROMAGNETIC ENVIRONMENT MEASUREMENTS OF PERSONALIZED RAPID TRANSIT SYSTEMS AT 'TRANSPO 72'. VOLUME V. TTI SYSTEM.
Final rept. Jan-Sep 72,
Earl E. Jamison. Jan 74, 36p DOT-TSC-UMTA-73-15-Vol-5, UMTA-MA-06-0031-73-Vol-5
Contract DOT-TSC-375
See also Volume 4, PB-233 195, and Volume 5, PB-233 197.

Descriptors: *Rapid transit railways, *Passenger transportation, *Electromagnetic environments, Urban transportation, Spectrum signatures, Electromagnetic noise , Electromagnetic compatibility, Electromagnetic radiation, Measurement, Extremely low frequency, Very low frequency, Low frequency.
Identifiers: PRT(Personalized Rapid Transit), *Personalized rapid transit.

An X-Y plot is made of the radiated Electromagnetic signals and noise between 1KHz and 50KHz at each of the four Personalized Rapid Transit (PRT) sites at Dulles International Airport. The PRT systems were operated individually to establish the signal characteristics of each system. A spectrum analyzer was used to view the frequency spectrum broadband prior to recording and a Polaroid scope camera was used in conjunction with the spectrum analyzer to photograph signals between 50KHz and 50MHz. This frequency range was sufficiently broad to cover all command and control frequencies of the four PRT systems.

PB-233 197/3GA PC$4.50/MF$1.45
National Scientific Labs., Inc., McLean, Va.
ELECTROMAGNETIC ENVIRONMENT MEASUREMENTS OF PERSONALIZED RAPID TRANSIT SYSTEMS AT 'TRANSPO 72'. VOLUME VI.
Final rept. Jan-Sep 72,
Earl E. Jamison. Jan 74, 104p DOT-TSC-UMTA-73-15-Vol-6, UMTA-MA-06-0031-73-Vol-6
Contract DOT-TSC-375
See also Volume 5, PB-233 196 and Volume 7, PB-233 198.

Descriptors: *Rapid transit railways, *Passenger transportation, *Electromagnetic environments, Urban transportation, Electromagnetic noise, Spectrum signatures, Electromagnetic compatibility, Electromagnetic radiation, Measurement, Extremely low frequency, Low frequency.
Identifiers: PRT(Personalized Rapid Transit), *Personalized rapid transit.

An X-Y plot is made of the radiated electromagnetic signals and noise between 1 KHz and 50KHz at each of the four Personalized Rapid Transit (PRT) sites at Dulles International Airport. The PRT Systems were operated simultaneously in an effort to determine if any interaction existed between systems. A spectrum analyzer was used to view the frequency spectrum broadband prior to recording and a Polaroid scope camera was used in conjunction with the spectrum analyzer to photograph signals between 50KHz and 50MHz. This frequency range was sufficiently broad enough to cover all command and control frequencies of the four PRT systems.

PB-233 198/1GA PC$3.75/MF$1.45
National Scientific Labs., Inc., McLean, Va.
ELECTROMAGNETIC ENVIRONMENT MEASUREMENTS OF PERSONALIZED RAPID TRANSIT SYSTEMS AT 'TRANSPO 72'. VOLUME VII.
Final rept. Jan-Sep 72,
Earl E. Jamison. Jan 74, 51p DOT-TSC-UMTA-72-15-Vol-7, UMTA-MA-06-0031-73-Vol-7
Contract DOT-TSC-375
See also Volume 6, PB-233 197, and Volume 8, PB-233 199.

Descriptors: *Rapid transit railways, *Passenger transportation, *Electromagnetic environments, Urban transportation, Power lines, Electromagnetic noise, Spectrum signatures, Electromagnetic compatibility, Electromagnetic radiation, Measurement, Extremely low frequency, Low frequency, Alternating current.
Identifiers: PRT(Personalized Rapid Transit), *Personalized rapid transit.

The report covers the measurements of the broadband conducted noise present on the A.C. power lines feeding the Personalized Rapid Transit (PRT) systems at Dulles Airport with all four systems off. The purpose of the measurement effort was to evaluate the electrical environment existing on each of the PRT 'hot' and neutral A.C. power lines prior to the installation and operation of any of the systems. These data will provide a baseline for use in establishing the relative increase in EMI levels associated with PRT system operation. Data obtained under this effort will enable an evaluation of whether or not existing or potential EMI levels might effect the normal operation of the PRT systems. Such interference could conceivably contribute to breakdown, malfunctions, or safety problems associated with the automated equipment used by the PRT systems in performing normal functions.

PB-233 199/9GA PC$3.25/MF$1.45
National Scientific Labs., Inc., McLean, Va.
ELECTROMAGNETIC ENVIRONMENT MEASUREMENTS OF PERSONALIZED RAPID TRANSIT SYSTEMS AT 'TRANSPO 72'. VOLUME VIII. DASHAVEYOR SYSTEM.
Final rept. Jan-Sep 72,
Earl E. Jamison. Jan 74, 35p DOT-TSC-UMTA-72-15-Vol-8, UMTA-MA-06-0031-73-Vol-8
Contract DOT-TSC-375
See also Volume 7, PB-233 198, and Volume 9, PB-233 200.

Descriptors: *Rapid transit railways, *Passenger transportation, *Electromagnetic environments, Urban transportation, Power lines, Electromagnetic noise, Spectrum signatures, Electromagnetic compatibility, Electromagnetic radiation, Measurement, Extremely low frequency, Low frequency, Alternating current.
Identifiers: PRT(Personalized Rapid Transit), *Personalized rapid transit.

The report covers the measurements of the broadband conducted noise present on the A.C. power lines feeding the Personalized Rapid Transit (PRT) systems at Dulles Airport with each system operating individually. The purpose of the measurement effort was to evaluate the electrical environment existing on each of the PRT'hot' and neutral A.C. power lines and to assess the effect of each system on the power line with all other PRT systems turned off. The measurements obtained during this test will be used for a comparison with data obtained with no PRT systems operating and with all four PRT systems operating simultaneously.

PB-233 200/5GA PC$3.25/MF$1.45
National Scientific Labs., Inc., McLean, Va.
ELECTROMAGNETIC ENVIRONMENT MEASUREMENTS OF PERSONALIZED RAPID TRANSIT SYSTEMS AT 'TRANSPO 72'. VOLUME IX. FORD SYSTEM.
Final rept. Jan-Sep 72,
Earl E. Jamison. Jan 74, 29p DOT-TSC-UMTA-72-15-Vol-9, UMTA-MA-06-0031-73-Vol-9
Contract DOT-TSC-375
See also Volume 8, PB-233 199, and Volume 10, PB-233 201.

Descriptors: *Rapid transit railways, *Passenger transportation, *Electromagnetic environments, Urban transportation, Power lines, Electromagnetic noise, Spectrum signatures, Electromagnetic compatibility, Electromagnetic radiation, Measurement, Extremely low frequency, Low frequency, Alternating current.

Identifiers: PRT(Personalized Rapid Transit), *Personalized rapid transit.

The report covers the measurements of the broadband conducted noise present on the A.C. power lines feeding the Personalized Rapid Transit (PRT) systems at Dulles Airport with each system operating individually. The purpose of the measurement effort was to evaluate the electrical environment existing on each of the PRT 'hot' and neutral A.C. power lines and to assess the effect of each system on the power line with all other PRT systems turned off. The measurements obtained during this test will be used for a comparison with data obtained with no PRT systems operating and with all four PRT systems operating simultaneously.

PB-233 201/3GA PC$3.25/MF$1.45
National Scientific Labs., Inc., McLean, Va.
ELECTROMAGNETIC ENVIRONMENT MEASUREMENTS OF PERSONALIZED RAPID TRANSIT SYSTEMS AT 'TRANSPO 72'. VOLUME X. MONOCAB SYSTEM.
Final rept. Jan-Sep 72,
Earl E. Jamison. Jan 74, 28p DOT-TSC-UMTA-72-15-Vol-10, UMTA-MA-06-0031-73-Vol-10
Contract DOT-TSC-375
See also Volume 9, PB-233 200, and Volume 11, PB-233 202.

Descriptors: *Rapid transit railways, *Passenger transportation, *Electromagnetic environments, Urban transportation, Power lines, Electromagnetic noise, Spectrum signatures, Electromagnetic compatibility, Electromagnetic radiation, Measurement, Extremely low frequency, Low frequency, Alternating current.
Identifiers: PRT(Personalized Rapid Transit), *Personalized rapid transit.

The report covers the measurements of the broadband conducted noise present on the A.C. power lines feeding the Personalized Rapid Transit (PRT) systems at Dulles Airport with each system operating individually. The purpose of the measurement effort was to evaluate the electrical environment existing on each of the PRT 'hot' and neutral A.C. power lines and to assess the effect of each system on the power line with all other PRT systems turned off. The measurements obtained during this test will be used for a comparison with data obtained with no PRT systems operating and with all four PRT systems operating simultaneously.

PB-233 202/1GA PC$3.25/MF$1.45
National Scientific Labs., Inc., McLean, Va.
ELECTROMAGNETIC ENVIRONMENT MEASUREMENTS OF PERSONALIZED RAPID TRANSIT SYSTEMS AT 'TRANSPO 72'. VOLUME XI. TTI SYSTEM.
Final rept. Jan-Sep 72,
Earl E. Jamison. Jan 74, 26p DOT-TSC-UMTA-73-15-Vol-11, UMTA-MA-06-0031-73-Vol-11
Contract DOT-TSC-375
See also Volume 10, PB-232 201, and Volume 12, PB-233 203.

Descriptors: *Rapid transit railways, *Passenger transportation, *Electromagnetic environments, Urban transportation, Power lines, Electromagnetic noise, Spectrum signatures, Electromagnetic compatibility, Electromagnetic radiation, Measurement, Extremely low frequency, Low frequency, Alternating current.
Identifiers: PRT(Personalized Rapid Transit), *Personalized rapid transit.

The report covers the measurements of the broadband conducted noise present on the A.C. power lines feeding the Personalized Rapid Transit (PRT) systems at Dulles Airport with each system operating individually. The purpose of the measurement effort was to evaluate the electrical environment existing on each of the PRT 'hot' and neutral A.C. power lines and to assess the effect of each system on the power line with all other PRT systems turned off. The measurements obtained during this test will be used for a comparison with data obtained with no PRT systems operating and with all four PRT systems operating simultaneously.

PB-233 203/9GA PC$4.50/MF$1.45
National Scientific Labs., Inc., McLean, Va.
ELECTROMAGNETIC ENVIRONMENT MEASUREMENTS OF PERSONALIZED RAPID TRANSIT SYSTEMS AT 'TRANSPO 72'. VOLUME XII.
Annual rept. Jan-Sep 72,
Earl E. Jamison. Jan 74, 125p DOT-TSC-UMTA-73-15-Vol-12, UMTA-MA-06-0031-73-Vol-12
Contract DOT-TSC-375
See also Volume 11, PB-233 202.

Descriptors: *Rapid transit railways, *Passenger transportation, *Electromagnetic environments, Urban transportation, Power lines, Electromagnetic noise, Spectrum signatures, Electromagnetic compatibility, Electromagnetic radiation, Measurement, Extremely low frequency, Low frequency, Alternating current.
Identifiers: PRT(Personalized Rapid Transit), *Personalized rapid transit.

The report covers the measurements of the broadband conducted noise present on the A.C. power lines feeding the Personalized Rapid Transit (PRT) systems with all four systems operating simultaneously. The purpose of the measurement effort was to evaluate the electrical environment existing on each of the PRT 'hot' and neutral A.C. power lines and to assess the effect if any, on each individual system with all of the other systems operating simultaneously. Each system is isolated from the main high voltage line by a stepdown transformer which should filter out most unwanted higher frequency spikes. The measurements obtained during this test will be used for a comparison with data obtained with no PRT systems operating and with each system operating individually.

13G. Hydraulic and Pneumatic Equipment

AD-780 787/8GA PC$3.75/MF$1.45
Advisory Group for Aerospace Research and Development Paris (France)
ANNULUS WALL BOUNDARY LAYERS IN TURBOMACHINES.
AGARDograph rept.,
J. H. Horlock, and H. J. Perkins. May 74, 69p Rept no. AGARD-AG-185
NATO furnished.

Descriptors: *Turbomachinery, Boundary layer flow, Axially symmetric flow, Cascades(Fluid dynamics), Secondary flow, Mathematical models, Computer programs.

The paper reviews a substantial body of fundamental and applied research work on the subject of annulus wall boundary layers in turbomachines. A product of this work is a method for predicting, with reasonable accuracy, the full three-dimensional boundary layer that develops through a single blade row. The limitations of the method are discussed in relation to the experimental information available to the authors. In Part 2 the fundamental work is subjected to scrutiny in order to extract a boundary layer calculation method suitable for estimating the effects of annulus wall boundary layers on the performance of turbomachines. It is shown that a great many assumptions and simplifications are necessary at the present time but that reasonably satisfactory estimates are nevertheless possible. A computer program for the estimation of annulus blockage is listed.

N74-22143/3GA PC$10.25/MF$1.45
Martin Marietta Corp., Denver, Colo.
FLIGHT PROTOTYPE REGENERATIVE PARTICULATE FILTER SYSTEM DEVELOPMENT.
Final Report.
D. C. Green, and P. J. Garber. May 74, 141p
NASA-CR-134269, MCR-74-52
Contract NAS9-12685

Descriptors: *Fluid filters, *Hydraulic equipment, *Recirculative fluid flow, Particulate sampling, Space shuttles, Spacecraft components, Systems analysis.

For abstract, see STAR 1213

PATENT-3 791 262 Not available NTIS
Department of the Air Force Washington D C
POSITIVE TRI-POSITION LINEAR ACTUATOR.
Patent,
John H. Stachlin, and William J. Meyer. Filed 4 Jan 72, patented 12 Feb 74, 4p Rept nos. PAT-APPL-215 444,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Actuators, *Patents, Hydraulic actuators, Pneumatic actuators, Pressure, Structural members.
Identifiers: PAT-CL-92-52, *Linear actuators.

The patent relates to a tri-position linear actuator having a pair of pistons slideably mounted within an outer housing. These two pistons are actuated by a pressure differential. By varying the differential pressures acting on one or both of the pistons the actuator is moved to three distinct longitudinal positions.

13H. Industrial Processes

AD-780 567/4GA PC$6.50/MF$1.45
Georgia Univ Athens Dept of Statistics and Computer Science
A PRODUCT FLOW ANALYSIS WITH TIME-DEPENDENCE.
Technical rept.,
R. L. Wood. Dec 73, 251p Rept nos. TR-99, THEMIS-UGA-27
Contract N00014-69-A-0423

Descriptors: *Production control, *Queueing theory, *Computer programs, Network flows, Matrices(Mathematics), Distribution functions, Time lag theory, Mathematical models.
Identifiers: PRODFLOW computer program, M/M/s queue, Themis project.

The program PRODFLOW is an interactive program for analysis of a product flow assuming a linear model. The program allows for real time design and modification of any linear system and supplies tables of queue length with their corresponding probabilities as well as a graphic representation. A transient analysis is also provided for a more detailed study of the system. (Author)

AD-781 144/1GA PC$3.00/MF$1.45
Defence Research Information Centre Orpington (England)
AN EXTRACT FROM THE REPORT ON THE WORKING PARTY ON GAUGING FOR TAPE CONTROLLED MACHINE TOOLS.
Dec 73, 19p Rept nos. DRIC-BR-37714, S/T-Memo-18-73
Revision of Rept. no. S/T-Memo-1-73.

Descriptors: *Machine tools, *Monitoring, *Quality control, Control systems, Automation, Gages, Tolerances(Mechanics), Great Britain.
Identifiers: *Numerical control.

The investigation described relates to the development of a piece of equipment which when integrated into a numerically controlled drilling machine prevents manufacture proceeding if the desired x and y table co-ordinate movements are out of tolerance. By concentrating in this area it was hoped to reduce scrap resulting from errors in

table positioning and similarly by providing additional confidence to this part of the manufacturing operation, it was expected to materially reduce inspection costs. Possible applications concern components manufactured in small batches having a large number of holes to be drilled, bored, countersunk, etc. such as is found in the Aircraft industry.

BDX-613-1016 PC$4.50/MF$1.45
Bendix Corp., Kansas City, Mo. (Usa).
ULTRASONIC WELDING OF ELECTRICAL TERMINATIONS.
D. E. Stittsworth. Dec 73, 26p
Contract AT(29-1)-613

Descriptors: (*Aluminium, *Ultrasonic welding), (*Sap, Ultrasonic welding), (*Copper, Ultrasonic welding), Design, Electric cables, Electrical equipment, Performance testing, Thickness.

For abstract, see NSA 30 01, number 02383.

BDX-613-735(Rev.) PC$8.25/MF$1.45
Bendix Corp., Kansas City, Mo. (Usa).
VIBRATORY DEBURRING. FINAL REPORT.
L. K. Gillespie. Jan 74, 103p
Contract AT(39-1)-613

Descriptors: (*Metals, *Surface finishing), (*Solids, Surface finishing), Cost, Machining, Mechanical polishing, Mechanical vibrations, Plating, Roughness, Surface cleaning, Welding.

For abstract, see NSA 30 01, number 02309.

BDX-613-988(Rev.) PC$4.75/MF$1.45
Bendix Corp., Kansas City, Mo. (Usa).
MECHANICAL DEBURRING OF PLASTICS. FINAL REPORT.
R. J. Hishaw. Jan 74, 33p
Contract AT(29-1)-613

Descriptors: (*Organic polymers, *Surface finishing), (*Plastics, Surface finishing), Abrasives, Machining, Mechanical vibrations, Roughness.

For abstract, see NSA 30 01, number 02312.

N74-22138/3GA PC$4.00/MF$1.45
Kanner (Leo) Associates, Redwood City, Calif.
DIFFUSION WELDING IN AVIATION TECHNOLOGY.
K. Karlinski. Apr 74, 14p NASA-TT-F-15568
Contract NASW-2481
Tran-Transl. Into English from Tech. Lotnicza Astronaut. (Warsaw), V. 27, Jul. 1973 p 25-28.

Descriptors: *Aircraft industry, *Aircraft production, *Airframes, *Welded structures, Mechanical properties, Metal bonding, Titanium alloys, Weld strength.

For abstract, see STAR 1213

N74-22142/5GA PC$7.50/MF$1.45
Lockheed Missiles and Space Co., Sunnyvale, Calif.
PARTS, MATERIALS, AND PROCESSES EXPERIENCE SUMMARY, VOLUME 1.
1973, 347p NASA-SP-6507-VOL-1-REV
Contract NAS2-6060

Descriptors: *Aerospace industry, *Product development, *Production engineering, *Quality control, Failure analysis, Materials tests, Reliability engineering, Systems analysis.

For abstract, see STAR 1213

N74-22154/0GA PC$10.00/MF$1.45
Centre de Recherches Scientifiques et Techniques de l'Industrie des Fabrications Metalliques, Brussels (Belgium). Section Construction Mecanique.
DESIGN OF A CLASSIFICATION SCHEME FOR MECHANICAL PARTS CENTERED ON FABRICATION GROUP TECHNOLOGY IMPLANTATION D'UN SYSTEME DE CLASSIFICATION DE PIECES AXE SUR LA FABRICATION TECHNOLOGIE DE GROUPES.
J. Peters, W. Dumong, and M. Dieperinck. Jan 74, 137p CRIF-MC-49
Subm-Sponsored by the Inst. Pour l'Encour. De la Rech. Sci. Dans l'Ind. Et l'Agr.
Language in French.

Descriptors: *Machine tools, *Mechanical engineering, *Production engineering, *Standardization, Coding, Data processing, Forecasting, Information management, Scheduling, Specifications, Time optimal control.

For abstract, see STAR 1213

13I. Machinery and Tools

AD-780 817/3GA PC$3.75/MF$1.45
Army Mobility Equipment Research and Development Center Fort Belvoir Va
CONTAINER SPREADER-BAR ACTIVITIES.
Interim rept. Mar 72-Jun 73,
Peter Durenec, and I. A. Ashie. Jan 74, 69p Rept no. USAMERDC-2086

Descriptors: *Cargo ships, *Shipping containers, *Positioning devices(Machinery), Structural members, Hydraulic equipment, Stresses, Stress strain relations, Experimental design.
Identifiers: *Containerships, Spreader bars.

Commercial spreader bars were evaluated for lifting 20-foot intermodal shipping containers weighing 20 long tons. Requirements include use by cranes and helicopters for logistics over-the-shore operations, at inland distribution points, and for container retrograde. Commercial spreader bars have unsuitable features, so three prototypes were developed. All prototypes use twist locks for coupling to containers. Two prototypes have side and end guides, and the other has retractable corner guides for alignment to the container. One prototype has a lightened steel frame developed in-house by USAMERDC and uses a hydraulic twist-lock system developed under contract. An electrically operated, steel frame spreader bar was developed under contract. An aluminum frame spreader bar was developed in-house, using mechanical twist locks operated by a fifth (center) leg of the hoist sling. (Modified author abstract)

BDX-613-1065(Rev.) PC$4.00/MF$1.45
Bendix Corp., Kansas City, Mo. (Usa).
NONMETALLIC TOOLING CAPABILITIES AND ECONOMICS. FINAL REPORT.
R. W. Freund. May 74, 15p
Contract AT(29-1)-613

Descriptors: (*Nonmetals, *Machining), (*Epoxides, Machining), (*Polycarbonates, Machining), (*Silicon compounds, Machining), Casting molds, Connectors, Economics, Electric cables, Fabrication, Molding, Nylon, Rubbers, Tools.

For abstract, see NSA 30 01, number 02314.

N74-21854/6GA PC$4.00/MF$1.45
Australian Post Office Research Labs., Melbourne.
SEMI-CONDUCTIVE INTERLAYER COMPOUND FOR CABLES.
H. J. Ruddell. Aug 73, 7p REPT-6824

Descriptors: *Cables (Ropes), *Interlayers, *Semiconductors (Materials), Graphite, Polymers, Powder (Particles).

For abstract, see STAR 1213

N74-22137/5GA PC$4.00/MF$1.45
Linguistic Systems, Inc., Cambridge, Mass.
MAGNETIC BEARINGS FOR HIGH SPEED ROTORS.
D. Scheffer. Jan 74, 16p NASA-TT-F-14788
Contract NASW-2482
Tran-Transl. Into English from Messtechnik (West Germany), V. 1, Jan. 1972 p 1-6.

Descriptors: *Bearings, *Centrifugal compressors, *Magnetic materials, Angular velocity, Precession, Rotors.

For abstract, see STAR 1213

N74-22140/9GA PC$9.00/MF$1.45
Industrial Tectonics, Inc., Compton, Calif. Research and Development Div.
EXPERIMENTAL BALL BEARING DYNAMICS STUDY.
Final Report.
H. R. Signer. Oct 73, 118p NASA-CR-134528, ITI-P-1246
Contract NAS3-16730

Descriptors: *Ball bearings, *High speed cameras, *Kinematics, Bodies of revolution, Photointerpretation, Rates (Per time), Spin stabilization, Thrust loads, Turbomachinery.

For abstract, see STAR 1213

N74-22148/2GA PC$5.75/MF$1.45
Industrial Tectonics, Inc., Compton, Calif. Research and Development Div.
DESIGN, FABRICATION, AND OPERATION OF A TEST RIG FOR HIGH-SPEED TAPERED-ROLLER BEARINGS.
Final Report.
H. R. Signer. Jan 74, 51p NASA-CR-134595, ITI-P-1248
Contract NAS3-16812

Descriptors: *Environmental tests, *Performance tests, *Roller bearings, *Test equipment, Equipment specifications, Reliability engineering, Systems analysis.

For abstract, see STAR 1213

N74-22149/0GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
EVALUATION OF CHROMIUM OXIDE AND MOLYBDENUM DISULFIDE COATINGS IN SELF-ACTING STOPS OF AN AIR-LUBRICATED RAYLEIGH STEP THRUST BEARING.
Z. N. Nemeth. May 74, 23p NASA-TN-D-7656, E-7777

Descriptors: *Bearing alloys, *Chromium oxides, *Molybdenum disulfides, *Thrust bearings, Equipment specifications, Performance tests, Product development, Protective coatings.

For abstract, see STAR 1213

13J. Marine Engineering

AD-780 540/1GA PC$5.50/MF$1.45
Center for Naval Analyses Arlington Va
THE SOVIET PORT-CLEARING OPERATION IN BANGLADESH, MARCH 1972-DECEMBER 1973,
Charles C. Petersen. Jun 74, 46p Rept no. CNA-Professional Paper-123

Descriptors: *USSR, *Harbors, *Clearances, *South Asia, Safety, Marine salvage, Political science.
Identifiers: *Bangladesh.

The Soviet port-clearing operation in Bangladesh represented a new departure in the Soviets' use of their naval forces for political purposes. Until it was undertaken, the Soviet Navy's 'political' operations had been confined largely to one or

another variant of coercive diplomacy. The operation in Chittagong, however, is an exercise in influence-building by non-coercive methods. The results, from the Soviet point of view, cannot have been entirely positive. For this reason, the Soviets may well be much more cautious in the future about committing their navy to such projects.

AD-780 609/4GA Not available NTIS
National Physical Lab Teddington (England) Ship Div
HYDRODYNAMIC CONSIDERATIONS IN THE DESIGN OF CONDENSER COOLING WATER SYSTEMS FOR LARGE SHIPS,
John W. English. Apr 74, 18p Rept no. NPL-Ship-177
Availability: Pub. in Transactions of the Royal Inst. of Naval Architects, v116 p31-46 1974.

Descriptors: *Tankers, *Steam condensers, *Water cooling, Marine surface propulsion, Steam turbines, Inlets, Boundary layer control, Drag, Great Britain.

The performance of intakes and outlets for main condenser cooling water systems are discussed. Water tunnel test results are given that show the relative performance of two intake types and the effect of grilles and yawed flow on them. Some boundary layer fences for improving intake performance are also described. The importance of choosing the best positions on the hull for intakes and outlets are discussed and a means of calculating the drag and power expenditures caused by cooling water systems is given. (Author)

AD-780 621/9GA Not available NTIS
National Physical Lab Teddington (England) Ship Div
SOME ASPECTS OF DUCTED PROPELLER PROPULSION,
J. W. English, and S. J. Rowe. Apr 74, 19p Rept no. NPL-Ship-178
Availability: Pub. in the Royal Institution of Naval Architects Symposium on Ducted Propellers, p20-34 1973, Paper No. 3.

Descriptors: *Marine propulsion, *Ducted propellers, Ship hulls, Interactions, Diffusers, Fluid flow, Meetings, Great Britain.

This paper discusses several aspects of ducted propellers that are important in ship propulsion. Possible the most important aspect and the one about which least is known is the ducted propeller/hull interaction problem. The first section describes some of the empirical observations made in this area at NPL in the course of testing VLCC forms. The advantages to be gained with a steerable ducted propeller system are mentioned. The following sections deal with the effect that diffusers downstream of the rotor have on performance and the losses associated with tip clearance. Finally, the results of an extensive flow survey in the exit plane of a ducted propeller are given. This survey tends to confirm some of the earlier findings and shows good agreement with the velocities predicted using a simple analysis procedure. (Author)

AD-780 690/4GA PC$3.75/MF$1.45
Naval Ship Research and Development Center Bethesda Md
INCLINED-SHAFT PROPELLER PERFORMANCE CHARACTERISTICS,
James G. Peck, and Donald H. Moore. Apr 74, 53p Rept no. NSRDC-4127

Descriptors: *Propellers(Marine), Fluid dynamics, Shafts(Machine elements), Thrusters, Pitch(Inclination), Cavitation, Torque, Loads(Forces).
Identifiers: *Inclined shafts.

Most small naval craft use commercially available propellers on inclined shafts as thrusters. Information about the forces generated by inclined-shaft propellers is scarce. To help the designer of small craft, an experimental program was undertaken to evaluate commercially available propeller performance when inclined to the oncoming flow. A series of four commercial propellers with pitch ratios of 0.8, 1.0, 1.2, and 1.4 were characterized over a range of shaft angles, cavitation numbers and advanced coefficients. Besides the usual shaftline thrust and torque, horizontal and vertical side forces were also measured. The results of these experiments support the previous assumption that a propeller on an inclined shaft may produce more forward thrust than the same propeller on a horizontal shaft. The paper contains propeller characteristic curves and lift- and side-force data that are directly applicable in the design of high-performance small craft. (Author)

AD-780 776/1GA PC$4.00/MF$1.45
Naval Ship Research and Development Center Bethesda Md
HYDROELASTIC DESIGN OF SUBCAVITATING AND CAVITATING HYDROFOIL STRUT SYSTEMS.
Research and development rept.,
Peter K. Besch, and Yuan-Ning Liu. Apr 74, 85p Rept no. NSRDC-4257

Descriptors: *Hydrofoil craft, *Hydrofoils, *Struts, Flutter, Hydroelasticity, Vibration, Bending, Lifting surfaces, Scaling factors, Cavitation.
Identifiers: Subcavitating hydrofoils.

The report presents design procedures and parametric trends that can be used to avoid flutter and divergence of hydrofoil strut-foil systems. Flutter stability of conventional T-foils can be achieved by scaling existing prototype systems which are stable; scaled flutter models must be used to determine the stability of new designs. Several stable T-foil designs are available for craft with displacements of up to 300 tons at subcavitating speeds (below 50 knots). The availability of higher speed designs for ships of practical size is limited to one system that is stable to 62 knots. Divergence stability of subcavitating systems can be ensured by theoretical analysis using an available computer program. (Author)

AD-780 783/7GA PC$3.25/MF$1.45
Naval Research Lab Washington D C
NAVAL RESEARCH LABORATORY DEEP OCEAN SEARCH AND INSPECTION SYSTEM.
Final rept.,
Jervis J. Gennari, and Richard B. Bridge. 3 Jun 74, 35p Rept no. NRL-7733

Descriptors: *Oceanographic ships, *Marine salvage, *Underwater equipment, Acoustic navigation, Electronic equipment, Shipboard, Towed vehicles, Towing cables, Specifications.
Identifiers: AGOR 11 vessel, DOSS(Deep Ocean Search System), Deep ocean search system, Ship modification.

NRL's Deep Ocean Search System (DOSS) is a refinement of the system used to locate the lost submarine Thresher in 1963. It consists of shipboard electronics, the facilities used for launching, towing and retrieving the towed vehicle (fish), and the instruments and sensors of the fish. (Author)

AD-780 860/3GA PC$4.75/MF$1.45
Trident Engineering Associates Inc Annapolis Md
REPORT ON WATER CHANNEL TEST OF BUOYANT WHEEL PROPULSION.
Final rept. Nov 73-Jun 74,
Bruce H. Rankin. 25 Jun 74, 31p
Contract N00167-74-C-0025

Descriptors: *Amphibious vehicles, *Marine surface propulsion, *Vehicle wheels, Foam, Polyurethane resins, Torque, Lift, Drag.
Identifiers: *Buoyant wheel propulsion, *Buoyant propulsion.

The document presents results of tests of models of buoyant wheel devices in a water channel. The devices are being considered for propulsion for amphibious vehicles. Solid models of foam plastic are tested at various velocities, depths of immersion, and torque load values. Data is presented to permit calculations. (Author)

AD-780 899/1GA PC$3.25/MF$1.45
Scripps Institution of Oceanography La Jolla Calif Advanced Ocean Engineering Lab
MODEL STUDIES OF STABLE FLOATING PLATFORMS USING THE PDP/8E COMPUTER.
Special technical rept.,
Donald Bellows. Aug 73, 47p Rept nos. AOEL-53, SIO-Ref-73-40
Contract N00014-69-A-0200-6012

Descriptors: *Stabilized platforms, *Floating bodies, *Model tests, Pitch(Motion), Stabilization, Roll, Pitch(Inclination), Measurement, Displacement, Correlation techniques, Deep water.
Identifiers: Design.

The Advanced Ocean Engineering Laboratory (AOEL) at the Scripps Institution of Oceanography has been working on the design and testing of stable floating platforms based upon the FLIP concept. The platforms under study at AOEL have two or more legs, each leg being comparable in size to FLIP, i.e., 300 feet long, 20 feet in diameter full scale. Small models (1/100 scale) are tested in the Scripps wave channel. The heave response was determined for each model, and in some cases the surge, sway, or pitch angle response was also determined.

AD-780 942/9GA PC$8.25/MF$1.45
Naval Postgraduate School Monterey Calif
FINITE ELEMENT ANALYSIS OF THE FORCED OSCILLATION OF SHIP HULL FORMS.
Master's thesis,
David Arthur Smith, Jr. Jun 74, 102p

Descriptors: *Ship hulls, Oscillation, Resonant frequency, Fluid flow, Dynamic response, FORTRAN, Theses.
Identifiers: FORTRAN 4 programming language, *Finite element analysis.

A study of the first and second-order, dynamic, ideal fluid effects on the forced, harmonic oscillations of a rigid cylinder in a free surface is presented. The solutions are obtained with a FORTRAN 4 computer program based on the finite element method using isoparametric elements. First-order added mass and damping in heave for a semi-circular and bulb hull form including finite depth effects are presented. Second-order solutions for the semi-circular hull form in heave also including finite depth effects are obtained. The solutions are verified by comparing with existing theory and experiment. (Author)

AD-780 988/2GA PC$7.50/MF$1.45
Michigan Univ Ann Arbor Dept of Industrial and Operations Engineering
HUMAN FACTOR APPLICATIONS IN BOATING SAFETY. VOLUME I.
Final rept.,
James M. Miller. Sep 73, 337p* USCG-D-90-74
Contract DOT-CG-33675-A
See also Volume 2, AD-781 205.

Descriptors: *Boats, *Safety, *Human factors engineering, Decision making, Perception, Operation, Anthropometry, Accidents, Wounds and injuries, Visibility, Recreation.
Identifiers: *Boat accidents.

Aspects of human factors engineering are applied to understanding the design and operation of boats. These are divided into three major areas. Under 'basic human characteristics; are the chapters on Operator Performance Stressors; Perception; Skill, Judgment and Decision Making;

Manual Handling of Outboards; and Anthropometrics. The subject of 'accident causal analysis' is pursued through an in-depth statistical analysis of the Current Accident Data, used in the 1972 CG-357 report. More useable data for causal determination could be achieved by giving attention to Future Data Collection Methodology. The topic of 'design practices' is the most applied group of chapters in the report. This includes discussions of Non-Collision Injury Potentials, Displays and Controls, Visibility Requirements, and Current Design Practices. The topic of Computer Display Design Assistance was pursued as a tool for determining the visibility and control reach requirements in various boat designs. (Modified author abstract)

N74-21922/1GA PC$10.25/MF$1.45
Draper (Charles Stark) Lab., Inc., Cambridge, Mass.
SCALE MODEL TESTING OF DROGUES FOR FREE DRIFTING BUOYS.
Final Report, Sep. 1972 - Sep. 1973.
W. A. Vachon. Sep 73, 143p NASA-CR-138122, R-769
Contract NAS8-28916

Descriptors: *Buoys, *Drag chutes, *Scale models, Costs, Oceanography, Performance tests, Tetherlines.

For abstract, see STAR 1213

PB-233 175/9GA PC$9.00/MF$1.45
Ocean Systems, Inc., Reston Va.
COMBUSTION TOILET FOR USE ON SMALL BOATS.
Final rept.,
Terrance S. McMahon. Jul 74, 120p EPA-670/2-74-053
Contract EPA-68-01-0133

Descriptors: *Sewage treatment, *Incinerators, *Boats, *Toilet facilities, Odor control, Oxidizers, Catalysts, Explosionproofing, Detectors, Exhaust gases, Combustion.
Identifiers: *Shipboard sewage treatment systems.

The feasibility of providing complete treatment of human waste by means of an incinerating toilet small and inexpensive enough to be suitable for use on small pleasure boats was investigated. A toilet that avoids the need for an auxiliary power supply by relying on natural draft was built. Its performance and the quality of its effluent were evaluated. The quality of effluent, both exhaust fumes and residual ash, is acceptable. However, the natural draft is unreliable, and the heat input needed to eliminate all odor from the exhaust fumes is greater than the unit can efficiently dissipate. The unit as constructed could potentially act as a source of ignition for explosive vapors originating elsewhere on the boat. A redesigned unit was constructed to burn with a forced draft at a lower temperature, and to use a catalytic oxidizer to eliminate odor from the exhaust fumes. An explosive vapor detector was designed into the circuit to eliminate the possibility of igniting extraneous vapors. This unit has not been tested and evaluated.

13K. Pumps, Filters, Pipes, Fittings, Tubing and Valves

AD-780 738/1GA PC$3.00/MF$1.45
Army Land Warfare Lab Aberdeen Proving Ground Md
PORTABLE PUMPING SYSTEM.
Final rept.,
Robert P. McGowan. May 74, 13p Rept no. LWL-TR-74-22

Descriptors: *Water cannons, *Pumps, *Riot control, Portable equipment, Valves, Cycles, Pumping, Water, Performance(Engineering), Efficiency, Civil disturbances.

A portable pumping system was developed for use by military units to control crowds in a civil disturbance situation. The system is a skid-mounted self-contained unit which can be transported by and used on a 2 1/2-ton military cargo truck, and which can also operate independent of the truck. The water stream is effective for controlling/dispersing personnel at ranges up to 75-80 feet. The system was developed from commercial components in order to provide a capability within a short time frame. A special motor-driven ball valve was developed to automatically and continuously pulse the water stream as an optional mode of operation to conserve the water supply. Brief acceptance tests were conducted to verify system performance. The system met the required specifications, and the pulsed water stream was effective. (Author)

AD-780 757/1GA PC$3.25/MF$1.45
AAI Corp Cockeysville Md
BALLISTICALLY OPERATED WATER CANNON.
Final rept.
Mar 74, 46p LWL-CR-04M72
Contract DAAD05-72-C-0153

Descriptors: *Water cannons, *Pumps, *Riot control, Cartridges(PAD), Cycles, Pumping, Water, Performance(Engineering), Efficiency, Civil disturbances, Spray nozzles, Muzzle velocity.

The primary purpose of the program was to develop, design and establish the feasibility of a cartridge actuated pumping system that will rapidly discharge discrete quantities of water at high pressure for crowd control purposes. Subsystem investigation was conducted to optimize cartridge performance with respect to desired pump output performance and establish the overall configuration of the system. Establishment of feasibility consisted of conducting a series of tests and demonstrations to determine the functional capability of the unit. (Author)

AD-780 819/9GA PC$3.00/MF$1.45
Edgewood Arsenal Aberdeen Proving Ground Md
OPTIMIZATION OF CHARCOAL DRYING TIME.
Technical rept. Nov 73-Jan 74,
Edward L. Meseke. Jan 74, 21p Rept no. ED-TR-74022

Descriptors: *Charcoal, *Gas filters, *Drying, Desorption, Moisture.
Identifiers: Whetlerite, Collective protection equipment.

Respirator and collective protection filters are required to meet a moisture specification before packaging because of the moisture-sensitive ASC Whetlerite on the charcoal. Although the specification must be met, there is no standard method for determining the drying time required for new filters. This study was designed to obtain a method for optimizing drying time based on the temperature, the filter bed depth, and the moisture on the filter. Desorption isotherms were found for four temperatures, two bed depths, and two flow conditions. By use of these and other available data, a method was devised for determinaton of an optimum drying time. In addition to the method for determination of optimum drying time, several other items of interest were learned. One, drying time can be reduced drastically by drying with an internal flow of hot air. This dynamic drying does not need as high a temperature as the static drying. Another was that the dryness of charcoal depends not only upon the bed depth but also the method and temperature of drying. (Author)

HSSTP-TR-34 PC$4.25/MF$1.45
Battelle Columbus Labs., Ohio (Usa).
INVESTIGATION OF MODE III CRACK EXTENSION IN REACTOR PIPING. FINAL REPORT.
R. J. Podlasek, and R. J. Eiber. 14 Dec 73, 23p
Contract Subcontract 3678

Descriptors: (*Pipes, *Fracture properties), (*Steel-astm-a106, Fracture properties), Defects, Reactor components.

For abstract, see NSA 30 01, number 00867.

PAT-APPL-461 477 PC$4.00/MF$1.45
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
AN INTERNALLY SUPPORTED FLEXIBLE DUCT JOINT.
Patent Application.
R. F. Kuhn, Jr.. Filed 16 Apr 74, 14p NASA-CASE-MFS-19193-1,
Subm-Sponsored by NASA.
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Bellows, *Flexible bodies, *Fluid flow, *Pressure effects, Equipment specifications, *Patent applications, Product development.

The development of an internally supported flexible duct for conducting fluids under high pressures in systems where relatively large deflection angles must be accomodated is discussed. The device is based on coaxially aligned bellows assemblies to provide flexibility with high internal pressures. Diagrams of the invention are provided and specific applications are proposed.

PATENT-3 797 781 Not available NTIS
Department of the Air Force Washington D C
DECELERATION RESPONSIVE FLOW VALVE.
Patent,
James T. Hollis. Filed 30 Oct 72, patented 19 Mar 74, 4p Rept nos. PAT-APPL-301 927,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Reentry vehicles, *Valves, *Patents, Aerodynamic heating, Cooling, Fluid flow.
Identifiers: PAT-CL-244-1-S-C.

The patent relates to a device whereby a coolant fluid is supplied to a permeable nose tip of a reentry vehicle from a coolant reservoir through a flow control valve. The valve has a spool type piston and sleeve valve wherein the orifice area changes as a function of deceleration. A second piston and sleeve valve is provided in the output of the flow control valve to maintain a constant pressure difference across the flow control valve.

PB-232 651/0GA PC$4.00/MF$1.45
Carnegie-Mellon Univ., Pittsburgh, Pa.
WORKSHOP ON RESEARCH AND EDUCATIONAL NEEDS IN THE PRESSURE VESSEL, PIPING, AND RELATED INDUSTRIES.
Final rept.,
M. C. Shaw. 4 Dec 73, 97p* PRI-74-103
Grant NSF-GK-40043

Descriptors: *Mechanical engineering, *Pressure vessels, *Piping systems, *Meetings, Research needs, Surveys Reviews, Workshops, Recommendations, Industrial research and development, Government generated technology, Universities, Plant equipment.

The purpose of the workshop was to bring together engineers from industry, universities, government, trade associations and foundations to discuss the educational and long range research needs of the pressure vessel, piping and related fields. The needs of industry, the present conditions in the university relative to meeting these needs, and some suggestions for possible changes are presented in a series of formal presentations and informal discussion by experts in their respective fields.

13L. Safety Engineering

AD-780 671/4GA PC$10.00/MF$1.45
Coast Guard Washington D C
A STUDY OF COST, BENEFITS, AND EFFECTIVENESS OF THE MERCHANT MARINE SAFETY PROGRAM.
1 May 68, 140p

Descriptors: *Marine transportation, *Coast Guard, *Safety, *Cost effectiveness, Merchant vessels, Shipboard, Ship auxiliary equipment, Inspection, Maintenance, Policies, Proficiency, Standards.
Identifiers: Benefit cost analysis, *Transportation safety, *Merchant Marine safety program.

The Merchant Marine Safety program of the Coast Guard has the objective of minimizing lives lost, property damage, and personal injury in marine transportation through prevention. This is accomplished through two programs. The first program deals primarily with making the vessel and the shipboard equipment safe for their intended use. The second deals with safety through operating personnel. The study represents the initial phase of a cost-benefit sensitivity analysis of alternative policies and procedures within the Inspection program.

PB-233 118/9GA PC$4.75/MF$1.45
Houston Univ., Tex. Dept. of Civil Engineering.
MULTIDISCIPLINARY ACCIDENT INVESTIGATION-PEDESTRIAN INVOLVEMENT.
Final rept. Jun 71-May 73,
K. J. Tharp. Jun 74, 125p DOT-HS-801 165
Contract DOT-HS-087-1-117

Descriptors: *Motor vehicle accidents, *Accident investigations, *Pedestrian movement, Collision research, Injuries, Texas, Recommendations, Safety.
Identifiers: *Pedestrian accidents, *Pedestrian safety.

The Houston Multidisciplinary Accident Investigation team investigated a total of 175 collisions involving pedestrians and motor vehicles which occurred in the City of Houston, Texas between June, 1971 and May, 1973. In addition, several years' data collected by the Houston Police was also obtained, analyzed for trends and compared to the team collected information. The overall data were used to describe factors such as the pedestrians and drivers involved in the accident event; the variations in frequencies by season, day of week, time of day; variation in pedestrain accident rates for different districts of the city; pedestrian and vehicle actions prior to the collisions; etc.

PB-233 125/4GA PC$3.75/MF$1.45
Local Government Personnel Inst., Salem, Oreg.
STATE OF OREGON INTERGOVERNMENTAL PERSONNEL ACT SAFETY PROGRAM.
Final rept.,
George J. Wolnez. 1973, 70p USCSC-73-OR-01C-34
Contract USCSC-73-OR-01C

Descriptors: *Safety, *Local government activities, *Oregon, *Project planning, Information, Management methods, Accident investigation, Regulations, Requirements, Industrial medicine, Incentives, Emergency preparedness, Control, Meetings, Communicating, Hazards, Environmental engineering, Protection, Technical assistance, Methodology.
Identifiers: Responsibility.

A 27-point safety program is organized in 15 preprinted file folders, each of which contains material telling how to carry out a particular part of the total program. Program elements are titled: (1) management participation and control, (2) assigned responsibility and accountability, (3) accident reporting and investigation system, (4) safety regulations and discipline controls, (5) mandatory safety inspection program, (6) safety meetings and and communication, (7) job hazard analysis, (8) machine guarding and environment controls, (9) occupational medical programs, (10) personal protective equipment controls, (11) emergency action plans, (12) employee awards and motivation, (13) equipment purchasing controls, (14) sources of technical help, and (15) safety procedures.

PB-233 248/4GA PC$4.50/MF$1.45
Pacific Southwest Forest and Range Experiment Station, Berkeley, Calif.
FIRE PREVENTION IN BUTTE COUNTY, CALIFORNIA. EVALUATION OF AN EXPERIMENTAL PROGRAM.
Forest Service research paper (Final),
William S. Folkman. 1973, 27p FSRP-PSW-98

Descriptors: *Fire prevention, *Forest fires, *California, Surveys, Attitudes, Projects, Law enforcement, Fire safety.
Identifiers: *Butte County(California).

An initial survey in 1964 measured the existing levels of knowledge and attitudes concerning use and abuse of fire in wildland areas among residents of Butte County, California. During the next six years, the California Division of Forestry carried out an intensive fire prevention program. A survey was conducted in 1970 to find out if any changes in levels of knowledge and attitude resulted. The evaluation showed little change during the interim.

PB-233 254/2GA PC$3.75/MF$1.45
National Transportation Safety Board, Washington, D.C.
COLLISION OF THE STATE-OF-THE-ART TRANSIT CARS WITH A STANDING CAR, HIGH SPEED GROUND TEST CENTER, PUEBLO, COLORADO, AUGUST 11, 1973.
Railroad accident rept.
1 May 74, 56p NTSB-RAR-74-2

Descriptors: *Accidents, *Railroads, *Accident investigations, Collision research, Railroad cars, Rapid transit railways, Test facilities, Management systems.
Identifiers: *Railroad accidents, *Crashworthiness.

On August 11,1973, the UMTA state-of-the-art rail rapid transit cars (SOAC's) collided with a standing railroad gondola car at the U.S. Department of Transportation's High Speed Ground Test Center near Pueblo, Colo. The SOAC's were being operated on the transit test track when they were inadvertently diverted through a switch onto an adjacent track and into the gondola. The motorman on the SOAC was killed. The National Transportation Safety Board determines that the probable cause of this crash was the failure of a locomotive crewmember to aline a switch properly and the failure of the motorman to detect the open switch in sufficient time to stop the SOAC's short of a gondola standing on the track. The report examines the crashworthiness of the SOAC's and the institutional errors that led to the accident.

Y-1916 PC$5.45/MF$1.45
Oak Ridge Y-12 Plant, Tenn. (Usa).
FIRE SPRINKLER NETWORK ANALYSIS PROGRAM.
J. T. Blackmon, and E. T. Stickle. 2 Apr 74, 95p
Contract W-7405-eng-26

Descriptors: (*Fires, *Safety), Combustion, Design, Efficiency, Hydraulics, Industrial plants, Memory devices, Pipes, Programming, Sprays.

For abstract, see NSA 30 01, number 02427.

13M. Structural Engineering

COM-74-11141/0GA PC$20.00/MF$20.00
National Technical Information Service, Springfield, Va.
EARTHQUAKE ENGINEERING: BUILDINGS, BRIDGES, DAMS, AND RELATED STRUCTURES. A BIBLIOGRAPHY WITH ABSTRACTS.
Rept. for 1964-May 74,
Guy E. Habercom, Jr. Jun 74, 195p* NTIS-WIN-74-054

Descriptors: *Earthquake resistant structures, *Structural mechanics, Earthquakes, Seismic waves, Structural response, Buildings, Bridges, Dams.
Identifiers: *Earthquake engineering.

This bibliography contains 190 selected abstracts of research reports retrieved using the NTIS online search system - NTISearch. The cited reports relate to studies of buildings, bridges, dams, and other structures subjected to seismic phenomena. Damage assessment is made and design inadequacies are revealed. Suggestions are presented for structural improvements for seismic response. Included are reports on site selection and earthquake-proofing for atomic power plants.

COM-74-50537/1GA PC-GPO/MF$1.45-NTIS
National Bureau of Standards, Washington, D.C. Center for Building Technology.
THE EFFECT OF IMPACT LOADINGS ON THE PERFORMANCE OF WOOD JOIST SUBFLOORING SYSTEMS.
Final rept.,
Hai Sang Lew. May 74, 37p NBS-BSS-52
Library of Congress Catalog Card no. 74-7013. Supersedes rept. no. NBSIR-73-187, PB-221 188.
Paper copy available from GPO $0.70 as C13.29/2:52.

Descriptors: *Floors, *Plywood, Impact strength, Loads(Forces), Structural analysis, Deflection, Joists, Wooden structures, Residential buildings, Impact tests.
Identifiers: Breakthrough operation, *Subfloors, Industrialized housing.

The report presents the results of an experimental study of wood-joist subflooring systems subjected to impact load. Six different types of subflooring systems were tested following the test method described in the ASTM Standard Methods (ASTM Designation E-72). The magnitude of impact load was varied by dropping a 60-lb bag from different heights. A concentrated static load of 400 lb was applied to the subfloor after it was exposed to impact load. It is suggested that the deflection under this concentrated load be used as a measure of the impact resistance of the subfloor.

COM-74-50538/9GA PC-GPO/MF$1.45-NTIS
National Bureau of Standards, Washington, D.C. Center for Building Technology.
STUDY OF THE LOCAL RESISTANCE OF CONVENTIONAL PLYWOOD SUBFLOORING TO CONCENTRATED LOAD.
Building science series (Final),
Felix Y. Yokel. May 74, 46p NBS-BSS-53
Library of Congress Catalog Card no. 74-600075. Supersedes rept. no. NBSIR-73-116, PB-220 432.
Paper copy available from GPO $0.85 as C13.29/2:53.

Descriptors: *Floors, *Plywood, Loads(Forces), Structural analysis, Wooden structures. Failure, Deflection, Residential buildings.
Identifiers: Breakthrough operation, *Subfloors, Industrialized housing.

Representative specimens, simulating the performance of five conventional plywood floor systems, were tested under concentrated load in order to compare their performance with that stipulated by performance criteria developed on

the basis of anticipated occupancy loads. In 24 out of 26 tests the performance of the specimens exceeded that required by the criteria. Data on failure loads, load-deflection characteristics and failure modes are presented and discussed.

JAB-99-117 PC$4.00/MF$1.45
Blume (John a.) and Associates Research Div., San Francisco, Calif. (Usa).
LOW-RISE BUILDING DAMAGE FROM LOW AMPLITUDE GROUND MOTIONS.
R. E. Scholl. Apr 74, 22p
Contract AT(26-1)-99

Descriptors: (*Nuclear explosions, *Ground motion), (*Buildings, *Seismic effects), Cost, Data, Nevada test site, Rulison event, Underground explosions.

For abstract, see NSA 30 01, number 00261.

N74-22533/5GA PC$6.50/MF$1.45
California Univ., Livermore. Lawrence Livermore Lab.
FILAMENT-WOUND KEVLAR 49/EPOXY PRESSURE VESSELS.
T. T. Chiao, M. A. Hamstad, M. A. Marcon, and J. E. Hanafee. 9 Nov 73, 66p NASA-CR-134506, UCRL-51466
NASA ORDER C-13980-C, Contract W-7405-ENG-48

Descriptors: *Filament winding, *Materials tests, *Pressure vessels, *Reinforcing fibers, *Tensile tests, Composite materials, Epoxy resins, Failure analysis, Mechanical properties.

For abstract, see STAR 1213

N74-22538/4GA PC$4.75/MF$1.45
Israel Inst. of Tech., Haifa. Dept. of Aeronautical Engineering.
OPTIMAL PLASTIC DESIGN OF DOUBLY SYMMETRIC CLOSED STRUCTURES.
S. C. Batterman, and L. P. Felton. May 71, 35p
TAE-126

Descriptors: *Optimization, *Plastics, *Structural design, *Symmetrical bodies, Bending, Cost analysis, Frames, Ring structures.

For abstract, see STAR 1213

PB-233 213/8GA PC$4.50/MF$1.45
California Univ., Berkeley. Earthquake Engineering Research Center.
SENSITIVITY ANALYSIS FOR HYSTERETIC DYNAMIC SYSTEMS: APPLICATION TO EARTHQUAKE ENGINEERING,
Debabrata Ray. Apr 74, 101p* EERC-74-5
Grant NSF-GI-36387

Descriptors: *Structural design, *Eartquake resistant structures, Dynamic structural analysis, Stiffness methods, Control theory, Systems analysis, Partial differential equations, Computer programming, Mathematical models.
Identifiers: *Sensitivity analysis.

The sensitivity analysis part of the total problem of optimum system synthesis using methods based on gradient search techniques, is developed. Two general theorems for sensitivity analysis with respect to a time-invariant parameter vector for a nonlinear (hysteretic), spatially discertized structural system subjected to dynamic excitation, are hypothesized and proved; a generalized Gronwall-type lemma is also proved. The applicability of the first theorem with the parameter vector consisting of moments of inertia of column sections of each story of a multistory building frame subjected to earthquake ground motion is established by numberical experimentation. A discussion of results and their implication to the development of methods for determining optimum earthquake-resistant designs of multistory buildings concludes the study. (Modified author abstract)

14. METHODS AND EQUIPMENT

14B. Laboratories, Test Facilities, and Test Equipment

AD-780 557/5GA PC$4.50/MF$1.45
New Mexico Univ Albuquerque Eric H Wang Civil Engineering Research Facility
DEVELOPMENT AND EVALUATION OF MEASUREMENT SYSTEMS FOR BLAST-INDUCED MOTIONS IN BURIED STRUCTURES.
Final rept. Jan-Dec 72,
Stephen F. Pickett. Apr 74, 124p AFWL-TR-73-230
Contract F29601-72-C-0024

Descriptors: *Underground structures, *Blast loads, *Measuring instruments, Potentiometers, Transducers, Stresses, Seismometers, Shock tubes, Dynamic tests, Nuclear explosions.

Four types of transducers for measuring blast-induced motions in buried structures were developed and/or evaluated. Potentiometric linear displacement transducers were evaluated based on vendor-supplied data. Application techniques, load error analysis and vendor-suggested improvements were also studied. A gage for measuring relative structure/media interface (shear) displacement was designed, developed, and tested in the CERF 2- x 40-ft shock tube. This gage performed well over the low displacement range for which it was designed. A seismometer for simultaneously measuring absolute structural displacement and velocity was also designed, built, and tested. This transducer also performed well. The suitability of WES Air Force Modified (WAM) stress gages and Simmons concrete stress gages for measuring dynamic structure/media interface normal stress was tested in the CERF 2- x 4-ft shock tube. During this test program unexpected results were obtained because of reverberations in the test configuration. Although the results were useful, the data were not adequate for a complete evaluation of these gages. (Author)

AD-780 565/8GA PC$3.00/MF$1.45
Explosives Research and Development Establishment Waltham Abbey (England)
IMPROVEMENTS TO AUTOMATIC OXYGEN ABSORPTION APPARATUS.
Technical note,
P. R. Hart. Mar 73, 10p Rept no. ERDE-TN-73
DRIC-BR-40528

Descriptors: *Oxygen, *Pressure measurement, Laboratory equipment, Automatic, Gas analysis, Great Britain.
Identifiers: *Autoxidation, Reaction rates.

Automatic apparatus for measurements of autoxidation at constant oxygen pressures normally relies on the make and break of mercury contacts. These are usually troublesome because of their sensitivity to small temperature changes and to contamination. These problems, as well as those connected with contacts in which a liquid meniscus can vary in shape, were successfully overcome with the aid of a stainless steel float and the elimination of the mercury itself, viz the electrical contact maker. (Author)

AD-780 734/0GA PC$3.00/MF$1.45
Ballistic Research Labs Aberdeen Proving Ground Md
CENTRIFUGAL FAILURE OF A MAGNUS MODEL.
Final memorandum rept.,
Anders S. Platou. Apr 74, 13p Rept no. BRL-MR-2367

Descriptors: *Fins, *Wind tunnel models, *Magnus effect, Spin stabilized rockets, Rupture, Centrifugal force, Wind tunnels, Implosions, Safety.

The report describes an accident which occurred during a wind tunnel Magnus test. The model reached its bursting speed, broke a test section window, and the resulting implosion imbedded glass splinters in the steel test section and nozzle walls. Better methods of calculating bursting speeds and of pre-spinning models to their design spin are required. (Author)

AD-781 015/3GA Not available NTIS
Defence Research Establishment Ottawa (Ontario)
A SIMPLE DEVICE FOR THE COLLECTION OF GAS CHROMATOGRAPHIC EFFLUENTS FROM SMALL-BORE PACKED COLUMNS.
Technical note,
A. A. Casselman, and R. A. B. Bannard. 1 Nov 73, 7p Rept no. DREO-TN-74-2
Availability: Pub. in Jnl. of Chromatography, v90 p185-190 1974, Paper Chrom. 7194.

Descriptors: *Gas chromatography, *Collecting methods, Recovery, Laboratory equipment, Accumulators, Samplers, Efficiency, Canada.

The report describes a collector for gas chromatographic effluents from small bore packed columns. Design, results, and variables affecting recovery efficiency are discussed.

AD-781 027/8GA PC$4.00/MF$1.45
Army Foreign Science and Technology Center Charlottesville Va
AUTOMATION AS A MEANS OF IMPROVING ACCURACY, ACOUSTICAL MEASUREMENTS.
8 Mar 74, 16p Rept no. FSTC-HT-23-1780-73
Trans. of mono. Akusticheskie Izmereniya, Moscow, 1971 p243-253.

Descriptors: *Measuring instruments, Automation, Acoustic measurement, Translations, USSR.

The article discusses the use of automation in acoustical measurements and more specifically discusses a measuring apparatus from the 'Bryul' and K'er' company.

AD-781 104/5GA Reprint
Florida Univ Gainesville Dept of Chemistry
ON THE USE OF A POWER DIVIDER FOR THERMOSTATED ELECTRODELESS DISCHARGE LAMPS IN ATOMIC FLUORESCENCE SPECTROMETRY.
Interim rept.,
D. O. Knapp, C. J. Molnar, and J. D. Winefordner. 19 Nov 73, 5p AFOSR-TR-74-0900
Grant AF-AFOSR-1880-70
Revision of report dated 22 Aug 73.
Availability: Pub. in Analytical Chemistry, v46 n4 p622-623 Apr 74.

Descriptors: *Discharge lamps, Thermostats, Power dividers, Sensitivity, Chemical analysis, Atomic spectroscopy, Fluorescence.
Identifiers: *Atomic fluorescence flame spectroscopy, *Spectrochemical analysis, Electrodeless discharge lamps.

Thermostated EDLs (Electrodeless Discharge Lamps) operated at their optimal temperatures and powered by one microwave generator using a power divider are evaluated. Detection limits for atomic fluorescence spectrometric measurement of several elements with these EDLs were obtained and compared with other published results. (Author)

CEA-CONF-2470 PC$5.75/MF$1.45
Cea Centre d'Etudes Nucleaires de Saclay, 91 - Gif-sur-Yvette (France).
SLOW-ELECTRON SPECTROSCOPY APPLIED TO THE STUDY OF SURFACES.
J. Lecante. 75p CONF-730226-2
In French.

Descriptors: Electron spectroscopy, Electrons, Excitation, Relaxation, Surfaces.

For abstract, see NSA 30 01, number 02389.

CEA-CONF-2471 PC$4.50/MF$1.45
Cea Centre d'Etudes Nucleaires de Saclay, 91 - Gif-sur-Yvette (France).
AUGER-ELECTRON SPECTROSCOPY. IONIZATION-LOSS SPECTROSCOPY. APPEARANCE-POTENTIAL SPECTROSCOPY.
R. Riwan. 1973, 47p CONF-730226-3
In French.

Descriptors: Auger electron spectroscopy, Energy losses, Ionization, Surfaces.

For abstract, see NSA 30 01, number 02390.

COM-74-11051/1GA PC$4.00/MF$1.45
National Bureau of Standards, Boulder, Colo. Electromagnetics Div.
CALIBRATION OF RADIO RECEIVERS TO MEASURE BROADBAND INTERFERENCE.
Final rept. on Phase I,
Ezra B. Larsen. Sep 73, 76p NBSIR-73-335

Descriptors: *Radio receivers, Calibrating, Field strength, Electromagnetic interference, Broadband, Electromagnetic noise, Standards.
Identifiers: *Field strength meters.

The report covers one phase of a project to improve the accuracy for calibrating field-strength meters to measure broadband signals, especially impulse interference. (Modified author abstract)

COM-74-11077/6GA PC$4.25/MF$1.45
National Bureau of Standards, Boulder, Colo. Radio Standards Lab.
SOME MODIFICATIONS IN METHODS OF CALIBRATION OF UNIVERSAL RATIO SETS.
Technical note,
David Ramaley. 30 Aug 64, 24p NBS-TN-220

Descriptors: *Measuring instruments, Ratios, Calibrating, Revisions.
Identifiers: *Universal ratio sets.

Universal Ratio Sets can be calibrated by a number of different methods. The well established methods are very briefly outlined and emphasis is placed on some more recent developments. The choice of methods will depend upon available laboratory equipment and other considerations.

COM-74-50520/7GA Not available NTIS
National Bureau of Standards, Washington, D.C.
A REFERENCE NOISE STANDARD FOR MILLIMETER WAVES.
Final rept.,
W. C. Daywitt. Dec 73, 3p
Pub. in IEEE Transactions on Microwave Theory and Techniques, vMTT21 n12 p845-847 Dec 73.

Descriptors: *Standards, *Thermal noise, Millimeter waves, Calibrating, Sources.

The WR15 Thermal Noise Source that is used as the National Reference Standard of noise power in the frequency range from 56 GHz to 64 GHz is described in the following summary. The source forms a basis for both the noise power comparison service and noise figure service offered by the National Bureau of Standards in this frequency range.

COM-74-50539/7GA Not available NTIS
National Bureau of Standards, Boulder, Colo.
DISCONTINUITY CAPACITANCE OF A COAXIAL LINE TERMINATED IN A CIRCULAR WAVEGUIDE. II. LOWER BOUND SOLUTION.
Final rept.,
E. W. Risley, Jr. 1972, 1p
Pub. in CPEM Digest, p111 1972.

Descriptors: *Capacitance, *Coaxial cables, Standards, Computation.

The standard of reflection for coaxial line is the quarter wave short circuit termination. There are shortcomings to this standard; the fabrication cost is high and each termination is usable at only one frequency. However, an open-circuited coaxial line with extended outer conductor and solid inner conductor could be used advantageously as a standard termination because fabrication can be made using commercially available components, the device is broad-banded and losses are minimal. In addition to the high-frequency application, the termination can also be used at low frequencies as a standard of capacitance. In an earlier paper (Discontinuity Capacitance of a Coaxial Line Terminated in a Circular Waveguide, VOL. MTT-17, No. 2, Feb 1969), the input admittance Y sub in of this termination was calculated, assuming perfect conductivity, using a variational technique. A stationary form was derived for Y sub in which determined an upper bound to the discontinuity capacitance of the termination.

COM-74-50549/6GA PC-GPO/MF$1.45-NTIS
National Bureau of Standards, Boulder, Colo. Time and Frequency Div.
TIME AND FREQUENCY: THEORY AND FUNDAMENTALS,
Byron E. Blair. May 74, 441p NBS-Mono-140
Library of Congress Catalog Card no. 73-600299.
Paper copy available from GPO $8.65 as stock no. 0303-01202, C13.44:140.

Descriptors: *Time, *Frequency, *Fundamental constants, Theories, Atomic clocks, Frequency standards, Time measurement, Frequency measurement, Cesium frequency standards, Rubidium frequency standards, Crystal oscillators, Quartz, Frequency stability, Accuracy, Availability, Time standards, Time signals, Radio broadcasting, Masers, Loran.

The document is a tutorial Monograph describing various aspects of time and frequency (T/F). Included are chapters relating to elemental concepts of precise time and frequency; basic principles of quartz oscillators and atomic frequency standards; historical review, recent progress, and current status of atomic frequency standards; promising areas for developing future primary frequency standards; relevance of frequency standards to other areas of metrology including a unified standard concept; statistics of T/F data analysis coupled with the theory and construction of the NBS atomic time scale; an overview of T/F dissemination techniques; and the standards of T/F in the USA. The Monograph addresses both the specialist in the field as well as those desiring basic information about time and frequency. The authors trace the development and scope of T/F technology, its improvement over periods of decades, its status today, and its possible use, applications, and development in days to come.

JUL-1009-RX PC$5.75/MF$1.45
Kernforschungsanlage Juelich G.M.B.H. (F.R. Germany). Zentralinstitut fuer Reaktorexperimente.
BEHAVIOUR OF GAS THERMOMETERS IN THE TEMPERATURE RANGE FROM 300 TO 3000 K.
H. J. Leyers. Oct 73, 53p
In German.

Descriptors: (*Thermometers, *Performance), Comparative evaluations, Gases, High temperature, Medium temperature, Very high temperature.

For abstract, see NSA 30 01, number 00432.

MHSMP-74-5-B PC$4.00/MF$1.45
Mason and Hanger-Silas Mason CO., Inc., Amarillo, Tex. (Usa).
SHORE GAUGE STUDY.
J. L. Montague. Dec 73, 8p
Contract DA-11-173-AMC-487(A)

Descriptors: (*Silicones, Hardness), (*Hardness, *Measuring instruments), Mechanical tests, Performance.

For abstract, see NSA 30 01, number 02400.

N74-21897/5GA PC$4.00/MF$1.45
Kanner (Leo) Associates, Redwood City, Calif.
TEST STANDS FOR STUDYING TECHNOLOGICAL PROCESSES UNDER SIMULATED SPACE CONDITIONS.
B. Y. Paton, D. A. Dupko, V. N. Bernardskyi, V. F. Lapchinskiy, and V. V. Stesin. Apr 74, 12p
NASA-TT-F-15538, A74-12844
Contract NASW-2481
Tran-Transl. Into English from 24TH Intern. Astronautical Congr. (Baku), 7-13 Oct. 1973 p 12.

Descriptors: *Industries, *Manufacturing, *Space environment simulation, *Test stands, Production engineering, U.s.s.r..

For abstract, see STAR 1213

N74-22107/8GA PC$4.00/MF$1.45
Aeronautical Research Labs., Melbourne (Australia).
A-C EXCITED SELF BALANCING EQUIPMENT FOR MEASURING STRAIN GAUGE BALANCE OUTPUTS.
N. Pollock. Sep 73, 17p ARL/A-NOTE-341

Descriptors: *Ac generators, *Output, *Strain gage balances, Analog to digital converters, Quadratures.

For abstract, see STAR 1213

N74-22110/2GA PC$7.00/MF$1.45
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
CMG-INDUCED LST DYNAMICS.
S. M. Seltzer. 21 Feb 74, 80p NASA-TM-X-64833

Descriptors: *Control moment gyroscopes, *Gyroscopic coupling, *Large space telescope, Antifriction bearings, Equipment specifications, Numerical analysis, Systems analysis.

For abstract, see STAR 1213

N74-22112/8GA PC$4.00/MF$1.45
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
PARTICULATE AND AEROSOL DETECTOR.
Patent Application.
J. J. Wortman, R. P. Donovan, A. P. Brooks, L. K. Monteith, and W. H. Kinard. Filed 26 Apr 74, 13p
NASA-CASE-LAR-11434-1, PAT-appl-464 722
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Aerosols, *Gas detectors, *Particle energy, *Test equipment, Electrical properties, Equipment specifications, *Patent applications.

For abstract, see STAR 1213

N74-22605/1GA PC$10.00/MF$1.45
Physikalischen Vereins, Frankfurt am Main (West Germany).
ANNUAL REPORT FROM THE PHYSICAL SOCIETY AT FRANKFURT AM MAIN FOR THE PERIOD FROM 1 JANUARY 1972 UP TO 31 DECEMBER 1972 147TH YEAR OF THE SOCIETY JAHRESBERICHT DES PHYSIKALISCHEN VEREINS ZU FRANKFURT A. M. FUR DIE ZEIT VOM 1. 1. 1972 BIS ZUM 31. 12. 1972 147. VEREINSJAHR.
1973, 137p
Language in German.

Descriptors: *Astronomy, *Geology, *Meteorology, *Physiology, *Research facilities, *Research projects, Laser outputs, Radiobiology, Theoretical physics.

For abstract, see STAR 1213

PAT-APPL-412 855 PC$4.00/MF$1.45
Department of the Air Force Washington D C
PULSE PRESS TESTER.
Patent Application,
John W. Sober. Filed 5 Nov 73, 6p Rept no.
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Pressure vessels, *Propellants, Test fixtures, Patents, Force(Mechanics).
Identifiers: PAT-CL-73-93, Force pulse testers, *Patent applications.

The patent application relates to a pulse press testing apparatus in which a pressure vessel containing a propellant chamber is positioned adjacent to a force piston that acts upon a test specimen. Above the propellant chamber is a reaction piston which is movable into a back pressure chamber which contains one or more vents that can be adjusted to contour the shape of the pressure pulse. A pressure plate beneath the test specimen in the form of a rotary stepped incline plane applies torque for stress and strain tests and a concrete base is used as a seismic mass.

PAT-APPL-461 073 PC$4.00/MF$1.45
National Aeronautics and Space Administration. John F. Kennedy Space Center, Cocoa Beach, Fla.
LIGHTNING CURRENT MEASURING SYSTEMS.
Patent Application.
R. J. Wojtasinski, J. H. Jones, and R. V. Lisle.
Filed 15 Apr 74, 14p NASA-CASE-KSC-10807-1,
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Electric current, *Electrical measurement, *Lightning, Magnetic measurement, *Patent applications, Wave propagation.

An apparatus for monitoring and analyzing electrical currents produced by lightning strikes is described. The apparatus includes an electrically conductive mast which has currents produced responsive to lighting strikes. A first circuit means is coupled to the mast for generating DC voltage proportional to a peak current generated in the mast by each lightning strike. The first circuit includes a first coil encircling the mast for sensing the flux change produced by current flowing through the mast which is caused by a lightning strike and for generating a voltage responsive thereto. An integrator is coupled to the first coil for generating an integrated voltage proportional to the flux change sensed by the first coil. A peak voltage detector is coupled to the integrator for generating a voltage having an amplitude proportional to the peak of the integrated voltage. A second circuit means is coupled to the mast for generating digital signal representative of the wave shape of the current generated in the mast by each lightning strike. (Author)

PAT-APPL-462 706 PC$4.00/MF$1.45
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
ANTI-GRAVITY DEVICE.
Patent Application.
S. P. Singh. Filed 22 Apr 74, 11p NASA-CASE-MFS-22758-1,
Subm-Sponsored by NASA.
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Gravitational effects, *Mechanical devices, *Spheres, *Patent application, Product development, Systems analysis.

A device for demonstrating the effects of gravity was developed. The device consists of two spheres of different radii, a small sphere resting on top of a larger one. The center of gravity of the small sphere is located below its geometric center. When the small sphere is rolled without slippage on the surface of the large sphere and then released, the small sphere will resume its original position, thus seeming to defy the law of gravity. The desired results will only be obtained if the small sphere is moved through an angle of less than 30 degrees.

PATENT-3 648 516 Not available NTIS
National Aeronautics and Space Administration. Pasadena Office, Calif.
THIN FILM GAUGE.
Patent.
A. D. Mcronald. Patented 14 Mar 72, 4p NASA-CASE-NPO-10617-1,
Misc-Filed 29 May 1969 Supersedes N70-12618 (08 - 02, p 0288). Subm-Sponsored by NASA.
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Convective heat transfer, *Measuring instruments, *Metal surfaces, *Wind tunnels, *Patents, Surface temperature, Wind tunnels.

A thin film gauge for use in measuring distributed convective heat transfer rates occurring along given surfaces, is described. The gauge is particularly suited to measuring test surfaces in the air stream of a wind tunnel. The gauge is characterized by a plurality of painted platinum leads extend across the surface of a substrate; a pair of leads on the surface is adapted to deliver an electric current at a constant amperage through a selected thermally active area. Leads are also coupled at opposite sides of the thermally active area for detecting induced voltage drops occurring in the area so that the active length of the gauge is defined between voltage output leads. Changes in heat transfer to the thermally active area are isolated and determined by detecting induces changes in voltage drop.

PATENT-3 780 936 Not available NTIS
Department of Health, Education, and Welfare, Bethesda, Md. Patent Branch.
MIXER-SEPARATOR FOR AUTOMATED ANALYTICAL CHEMISTRY SYSTEM.
Patent,
Ian E. Bush. Filed 5 Jan 72, patented 25 Dec 73, 5p PAT-APPL-215 482,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C.20231 $0.50.

Descriptors: *Patents, *Mixers, *Centrifuges, Chemical analysis, Liquid phases, Laboratory equipment, Automatic control.
Identifiers: PAT-CL-233-20-R.

The patent describes a mixer-separator unit for use in automated analytical chemistry systems wherein two liquid phases are brought into intimate contact and then separated. The two liquids are put into a vessel where slow rotation slops them around in the vessel to secure intimate mixing. Fast rotation is begun after a preset interval which results in fast and efficient centrifugal separation of the phases. After another interval tap jets are opened to withdraw the denser phase and then the lighter phase.

PATENT-3 780 992 Not available NTIS
Department of Health, Education, and Welfare, Bethesda, Md. Patent Branch.
VIBRATING PIPETTE PROBE MIXER.
Patent,
Hiroshi H. Nishi, and Charles McCarthy. Filed 17 Jul 72, patented 25 Dec 73, 4p PAT-APPL-272 144,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Pipettes, *Mixers, *Vibrators(Machinery), Microanalysis, Laboratory equipment.
Identifiers: PAT-CL-259-19.

The invention relates to a vibrating pipette probe mixer which serves as an apparatus for dispensing and mixing microliter quantities of solution for use in ultra-micro chemical analyses. The pipette probe, preferably made of polyethylene or teflon tubing drawn to a fine tip, is connected either directly or indirectly to a variable oscillating device. The pipette probe is connected to a source of solution by a flexible connector. The amplitude of the vibration to the probe is preferably adjustable to accomodate the amount of mixture and the size of the reaction vessel for optimum mixing.

PATENT-3 791 736 Not available NTIS
Department of the Air Force Washington D C
METHOD AND APPARATUS UTILIZING THE PHASE VELOCITY DIFFERENCE OF LIGHT RAYS FOR MEASURING THE VELOCITY OF A MOVING OBJECT.
Patent,
Ronald G. Newburg. Filed 28 Apr 72, patented 12 Feb 74, 5p Rept nos. PAT-APPL-248 585,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Moving targets, *Velocity, *Measuring instruments, *Patents, Remote detectors, Optical equipment components.
Identifiers: PAT-CL-356-27, Velocity measurement.

The invention relates to velocity measurement methods and devices, and in particular to means for remotely measuring and monitoring the linear and angular velocities of moving objects. It also finds utility as a laboratory device for testing the laws of composition of phase velocities.

PATENT-3 795 452 Not available NTIS
Department of the Air Force Washington D C
INSTRUMENT FOR AUTOMATICALLY INSPECTING INTEGRATED CIRCUIT MASKS FOR PINHOLES AND SPOTS.
Patent,
Roger J. Bourdelais, Dominick Colangelo, Robert J. McFadyen, and James F. Elliott. Filed 28 Feb 73, patented 5 Mar 74, 5p Rept nos. PAT-APPL-336 585,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Test equipment, *Patents, Automatic, Photomasking, Masks, Integrated circuits, Defects(Materials), Television cameras, Vidicons, Microscopes, Signal processing.
Identifiers: PAT-CL-356-237.

The patent describes an apparatus for automatically detecting pinholes and spots in an integrated circuit photographic mask. The photographic mask is scanned by a television-type camera through a microscope to detect imperfections. Signals representing the imperfection are processed in logic circuitry.

PATENT-3 802 255 Not available NTIS
Department of the Air Force Washington D C
FIXTURE FOR TENSILE AND STRESS RUPTURE TESTING OF TURBINE BLADES.
Patent,
John O. Struthers, John A. Miller, and Raymond R. Boucher. Filed 8 Mar 72, patented 9 Apr 74, 3p Rept nos. PAT-APPL-232 835,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Gas turbine blades, *Test equipment, *Patents, Tensile properties, Stresses.
Identifiers: PAT-CL-73-103.

The patent describes a fixture to hold turbine blades, too small for conventional test-bar testing methods, which grasps the root and tip end of the blade. The fixture is formed of a suitable metal alloy and is molded to fit the blade tip and root, and is adapted to be secured to the testing machine.

PB-233 393/8GA PC$7.25/MF$1.45
Thermo-Systems, Inc., St. Paul, Minn.
STATE OF THE ART: 1971. INSTRUMENTATION FOR MEASUREMENT OF PARTICULATE EMISSIONS FROM COMBUSTION SOURCES. VOLUME III. PARTICLE SIZE.
Environmental protection technology series (Final),
Gilmore J. Sem, John A. Borgos, Kenneth T. Whitby, and Benjamin Y. H. Liu. Jul 72, 84p
APTD-1524
Contract CPA-70-23
See also Volume 2, PB-202 666.

Descriptors: *Particle size distribution, *Combustion products, *Size determination, *Classifiers, Aerodynamics, Particles, Monitors, Drag classifiers, Performance evaluation, Cyclone separators, Electrostatic separators, Elutriators, Centrifugal classifiers, Sizing screens, Fluid filters, Light scattering.

The report discusses candiate techniques for automatic or semi-automatic measurement of particle size distribution in combustion source effluents. Automatic or semi-automatic particle size measuring instruments do not yet exist for this application. This report considers the application to effluent streams of particle size measuring instruments used in other fields. The discussions emphasize the particulate concentration parameter (mass, number, surface area, etc.) which each technique senses as well as the method of classifying particles into size ranges (aerodynamically, electrostatically, optically, etc). Included are description of the basic operation of each technique, discussions of limitations of each technique, suggestions of possible major problems in applying each technique to effluent streams and an overall evaluation of each technique relative to others. (Modified author abstract)

SLA-73-5931 PC$4.00/MF$1.45
Sandia Labs., Albuquerque, N.Mex. (Usa).
MODERN TRENDS IN ENVIRONMENTAL TESTING.
A. J. Jr. Clark. 1 Feb 74, 16p CONF-740415-1

Descriptors: (*Environment, *Testing), Measuring methods, Mechanical vibrations, Shock waves, Simulators, Transfer functions.

For abstract, see NSA 30 01, number 02412.

SLA-73-5934 PC$4.00/MF$1.45
Sandia Labs., Albuquerque, N.Mex. (Usa).
COMPARISON OF SHOCK SPECTRA AND THE LEAST FAVORABLE RESPONSE TECHNIQUES IN A TRANSIENT VIBRATION TEST PROGRAM.
A. F. Witte, and D. O. Smallwood. 1974, 14p
CONF-740415-4

Descriptors: (*Mechanical vibrations, *Simulators), Shock waves, Testing.

For abstract, see NSA 30 01, number 02413.

SLA-73-7068 PC$4.00/MF$1.45
Sandia Labs., Albuquerque, N.Mex. (Usa).
METHODS USED TO MATCH SHOCK SPECTRA USING OSCILLATORY TRANSIENTS.
D. O. Smallwood. 1973, 12p

Descriptors: (*Space flight, *Simulators), (*Mechanical vibrations, Simulators), Analog systems, Energy spectra, Oscillations, Shock waves.

For abstract, see NSA 30 01, number 02414.

SLA-73-982 PC$5.75/MF$1.45
Sandia Labs., Albuquerque, N.Mex. (Usa).
TRANSIENT BEHAVIOR OF CIRCULAR FOIL HEAT-FLUX GAGES.
N. R. Keltner, and M. W. Wildin. Apr 74, 52p
Contract AT(29-1)-789

Descriptors: (*Thermal radiation, *Measuring instruments), (*Bolometers, *Sensitivity), Foils, Geometry, Performance, Radiant heat transfer, Thermocouples, Transients.

For abstract, see NSA 30 01, number 02405.

SLL-72-105 PC$4.75/MF$1.45
Sandia Labs., Livermore, Calif. (Usa).
PHOTO-OPTICAL INSTRUMENTATION OF FLYER PLATE TESTS.
D. P. VanDyke, and G. J. Rohwein. Mar 74, 34p
Contract AT(29-1)-789

Descriptors: (*Mechanical structures, Impact tests), (*Impact tests, *Photography), Shells.

For abstract, see NSA 30 01, number 02422.

SLL-73-292 PC$4.25/MF$1.45
Sandia Labs., Albuquerque, N.Mex. (Usa).
IMAGE ENHANCEMENT TECHNIQUES: ELECTRON MICROPROBE EXPERIMENT.
H. D. Jones. Mar 74, 25p

Descriptors: (*Electron probes, *Images), Holography, Nondestructive testing, Photography, Programming.

For abstract, see NSA 30 01, number 02423.

14D. Reliability

AD-780 908/0GA PC$3.00/MF$1.45
Polytechnic Inst of New York Brooklyn Dept of Electrical Engineering and Electrophysics
REDUNDANT SPARES ALLOCATION TO REDUCE RELIABILITY COSTS-II,
Leonard Shaw. 15 Apr 74, 20p Rept nos. PINY-EE/EP-74-010, PINY-EER-109
Contract N00014-67-A-0438-0013
See also report dated Sep 73, AD-768 363.

Descriptors: *Reliability(Electronics), *Redundant components, *Spare parts, Inventory control, Allocations, Metal oxide semiconductors, Integrated circuits, Modules(Electronics), Costs.
Identifiers: Large scale integrated circuits.

The problem considered here is the optimal selection of the inventory of spares for a system built from two kinds of modules, the larger of which can be connected so it performs the role of the smaller one. The optimal inventory is the least costly one which achieves a specified probability that the spares will not be exhausted over the design lifetime. For some costs and failure rates it is most economical to use the larger module for both roles, due to the resulting increase in flexibility in the deployment of a single type of spare module. Both analytical and simulation methods have been used to study this problem. (Author)

MRR-132 PC$5.50/MF$1.45
Technische Univ. Muenchen, Garching (F.R. Germany). Lab. Fuer Reaktorregelung und Anlagensicherung.
RELIABILITY OPTIMIZATION OF A SYSTEM WITH MIXED REDUNDANCIES.
K. B. Misra. Oct 73, 48p

Descriptors: (*Control systems, Reliability), (*Reliability, *Optimization), Algorithms.

For abstract, see NSA 30 01, number 00281.

N74-22248/0GA PC$4.00/MF$1.45
Manchester Univ. (England). Statistical Lab.
A QUICKEST DETECTION PROBLEM WITH COSTLY INFORMATION.
D. Balmer. Dec 73, 20p RR-46/DB/1
Subm-Prepared in Cooperation with Salford Univ.

Descriptors: *Cost analysis, *Data processing, Numerical control, Optimization, Quality control.

For abstract, see STAR 1213

14E. Reprography

AD-781 026/0GA PC$4.00/MF$1.45
Army Foreign Science and Technology Center Charlottesville Va
COMPARATIVE ANALYSIS OF LAVSAN- AND TRIACETATE-BASED AERIAL FILMS,
O. V. Portnova. 6 Apr 74, 10p Rept no. FSTC-HT-23-1604-73
Trans. of Geodeziya i Kartografiya (USSR) n9 p63-66 1972.

Descriptors: *Photographic film, *Aerial cameras, Aerial photography, Photogrammetry, Translations, USSR.

The metric properties of low-deformation type 16 lavsan aerial film were compared with those of type 15 triacetate-based aerial film. The analysis was based on materials of aerial photography of an experimental 10 x 10 km area.

AD-781 095/5GA PC$3.25/MF$1.45
Technical Operations Inc Burlington Mass
TOC ARMAMENT RECORDER/VIEWER.
Final rept.,
Russell F. Toone. Mar 74, 40p Rept no. TO-B-73-11 RADC-TR-74-73
Contract F30602-73-C-0093

Descriptors: *Photographic recording systems, Gun sight cameras, Coding, Colors, Electronics, Playback, Viewers, Acceptance tests, Weapons.

The report describes the application of established total optical color (TOC) photo techniques and use of existing playback-viewing equipments to provide a capability for acquisition of gun camera photo-records that may be viewed in either black-and-white or full color display. Neither new technology nor unique equipment evolved as a result of this report. Camera modifications, use of off-the-shelf equipment, system testing, and overall test results are defined in the body of the report. Representative specific test results are indicated by inclusion of acceptance test data sheets. (Author)

AD-781 123/5GA PC$4.00/MF$1.45
Boeing Aerospace Co Seattle Wash
DEVELOPMENT OF CRITERIA FOR PRINTING COLOR RECONNAISSANCE STEREO STRIP PHOTOGRAPHY FOR INTERPRETATION UNDER DYNAMIC VIEWING CONDITIONS.
Final rept.,
Conrad L. Kraft, and Charles D. Anderson. Dec 73, 89p AMRL-TR-73-104
Contract F33615-73-C-4034

Descriptors: *Aerial reconnaissance, *Color photography, *Photointerpretation, *Visual perception, Target recognition, Color vision, Stereoscopes, Photographic film, Space perception, Human factors engineering, Target acquisition.
Identifiers: Stereoscopic vision.

The purpose of the report is to determine, in searching for man-made targets in strip reconnaissance color photography, how the variables of camera lens convergence angle and film contrast contribute to performance and to develop a quantitative chromostereopsis test and determine the distribution of this phenomenon among observers.

Sixty-three individuals were screened for their visual acuity, stereopsis, phorias at infinity and, 14 inches (color vision only at 14 inches). After brief training their target acquisition performance was measured using a Sonne SC-2 near-real-time display of 1:2580 scale reconnaissance chromatic imagery. The effects of convergence angles of 0, 10 and 20 degrees and of high, medium and low film contrasts were investigated. In preparing the stimuli a new target acquisition test was developed using Kodak SO-242 high resolution color film. The flights were made by the USAF over Ft. Riley, Kansas.

AD-781 161/5GA PC$4.00/MF$1.45
Army Foreign Science and Technology Center Charlottesville Va
MATERIALS FOR COLOR PHOTOGRAPHY,
V. N. Dolbin, B. N. Ivanov, P. K. Pudozhgorskii, and Z. P. Sytnik. 10 Mar 74, 8p Rept no. FSTC-HT-23-1278-73
Trans. of Patent (USSR) 220 046, 14 Jun 68.

Descriptors: *Photographic chemicals, *Color photography, Patents, Naphthalenes, Dyes, Amides, Organic sulfur compounds, Translations, USSR.
Identifiers: Naphthols.

The invention is a developer for blue dye. The molecules of the substance contain a group with an aliphatic or fatty-aromatic residue to prevent diffusion. The group cleaves at the moment of formation of the dye. A preparation for it is described, and some results are given of comparison tests. The objective is sharper pictures with greater color saturation, as well as greater resolving power.

N74-22167/2GA PC$4.50/MF$1.45
Kanner (Leo) Associates, Redwood City, Calif.
CLASSICAL AND HOLOGRAPHIC GRATINGS. EFFICIENCY PROBLEMS AND THEIR BEARING ON INSTRUMENTAL SPECTROSCOPY.
J. Cordelle, J. P. Laude, R. Petit, and G. Pieuchard. Jun 73, 15p NASA-TT-F-14742
Contract NASW-2481
Tran-Transl. Into English from Nouv. Rev. D'Optique Appl. (France), V. 1, No. 3, 1970 p 149-154.

Descriptors: *Gratings (Spectra), *Holography, *Spectroscopy, Equipment specifications, Performance tests, Product development, Test equipment.

For abstract, see STAR 1213

N74-22168/0GA PC$4.00/MF$1.45
Kanner (Leo) Associates, Redwood City, Calif.
TOWARDS THE THEORETICAL DETERMINATION OF THE OPTIMAL PROFILE OF A HOLOGRAPHIC GRATING.
D. Maystre, and R. Petit. Jun 73, 8p NASA-TT-F-14743
Contract NASW-2481
Tran-Transl. Into English from Opt. Commun. (Netherlands), V. 4, No. 1, Sep. 1971 p 25-28.

Descriptors: *Gratings (Spectra), *Holographic interferometry, *Spatial filtering, Equipment specifications, Interference grating, Numerical analysis, Optimization.

For abstract, see STAR 1213

N74-22478/3GA PC$3.25/MF$1.45
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
TRIANGULATION OF MULTISTATION CAMERA DATA TO LOCATE A CURVED LINE IN SPACE.
C. L. Fricke. May 74, 42p NASA-TN-D-7538, L-9268

Descriptors: *Ballistic cameras, *Curves (Geometry), *Triangulation, Barium ion clouds, Computer programs, Digital computers, Photogrammetry.

For abstract, see STAR 1213

SLA-74-101 PC$4.00/MF$1.45
Sandia Labs., Albuquerque, N.Mex. (Usa).
LARGE APERTURE ELECTROOPTIC PHOTOGRAPHIC SHUTTER.
G. S. Phipps. Apr 74, 17p
Contract AT(29-1)-789

Descriptors: (*Photography, *Apertures).

For abstract, see NSA 30 01, number 02418.

15. MILITARY SCIENCES

15C. Defense

AD-780 925/4GA PC$4.00/MF$1.45
Honeywell Inc Hopkins Minn Government and Aeronautical Products Div
DESIGN AND DEVELOPMENT OF THE COMBINATION CLASSIFIER PRE-PROCESSOR (CCP).
Final rept.,
Leigh R. Wold. Feb 74, 87p
Contract DAAK02-73-C-0465

Descriptors: *Intrusion detectors, *Personnel detection, Detectors, Multiple operation, Intrusion detection, Transducers, Seismometers, Magnetic detectors, Acoustic detectors, Signal processing, Preprocessing, Security, Trade off analyses, Portable equipment, Electrets, Microphones, Magnetometers.

Five advanced development models of a Combination Classifier Pre-processor (CCP) were designed, fabricated, tested and delivered. Each includes a seismic, an acoustic, and a magnetic transducer. The units are self-contained, with batteries for 2-3 months operation, and provide analog output signatures at separate pins of a single interface connector. (Author)

AD-781 003/9GA PC$8.00/MF$1.45
Teledyne Brown Engineering Huntsville Ala Military Systems Div
A COMPUTER SIMULATION TO DETERMINE KINEMATIC INTERCEPTOR PERFORMANCE.
Technical rept.,
W. M. Langley. Dec 73, 98p Rept no. MSD-74-ABMDA-1784
Contract DAHC60-73-C-0017

Descriptors: *Antimissile defense systems, *Intercept trajectories, *Computerized simulation, Radar tracking, Mathematical models, Computer programs.
Identifiers: KIP computer program, CDC 7600 computers.

The equations of motion describing an interceptor engaging an exoatmospheric target were derived and programed into a computer simulation. The simulation (KIP-KINEMATIC INTERCEPTOR PERFORMANCE) is capable of determining interceptor preliminary performance requirements in terms of relative geometry and required velocity. Engagement constraints, such as baffle angle and radar horizon, are considered. A description of the KIP simulation is included in the Appendices. (Author)

15E. Logistics

AD-780 681/3GA PC$9.25/MF$1.45
Department of Defense Washington D C Logistics Systems Policy Committee
REVIEW OF COMMON SUPPLY SUPPORT OVERSEAS. VOLUME I. ANALYSIS,
John W. Beale. Jun 73, 121p
See also Volume 2, AD-780 683.

Descriptors: *Department of Defense, *Logistics support, Logistics planning, Finance, Policies, Inventory control, Cost effectiveness.
Identifiers: *Common Supply Support.

The basic objectives of the study were to: Determine the extent to which common supply support arrangements should be established; determine how common supply support arrangments should operate, including how they should be funded and what items should be encompassed; and, Prescribe the role the Unified Commander should have in controlling and managing common supply support arrangements. The report contains the findings, analyses, conclusions, and recommendations of the study, and is organized in two volumes. Volume I contains the analyses, conclusions, and recommendations of the study.

AD-780 683/9GA PC$30.75/MF$1.45
Department of Defense Washington D C Logistics Systems Policy Committee
REVIEW OF COMMON SUPPLY SUPPORT OVERSEAS. VOLUME II. FIELD RESEARCH AND DATA,
John W. Beale. Jun 73, 553p
See also Volume 1, AD-780 681.

Descriptors: *Department of Defense, *Logistics support, Logistics planning, Finance, Policies, Inventory control, Cost effectiveness, Korea, Hawaii, Ryukyu Islands, West Germany, Panama Canal.
Identifiers: *Common Supply Support.

The basic objectives of this study were to: Determine the extent to which common supply support arrangements should be established; determine how common supply support arrangements should operate, including how they should be funded and what items should be encompassed; and, prescribe the role the Unified Commander should have in controlling and managing common supply support arrangements. The Report contains the findings, analyses, conclusions, and recommendations of the study, and is organized in two volumes, as follows: Volume I contains the analyses, conclusions, and recommendations of this study. Volume II is divided into two Parts. Part A contains a description of the supply support systems of the Military Services overseas, as identified by the Task Group during field research. Part B contains a presentation of the analyses of the statistical data submitted by the Military Services in response to the data call issued by the Task Group.

AD-780 687/0GA PC$13.75/MF$1.45
Defense Supply Agency Alexandria Va Office of the Assistant Director Plans Programs and Systems
APPRAISAL OF COORDINATED PROCUREMENT IN THE DEPARTMENT OF DEFENSE (ACOP).
May 73, 211p

Descriptors: *Department of Defense, *Military procurement, *Logistics planning, Cooperation, Coding, Research management, Policies, Purchasing, Contracts, Logistics support.
Identifiers: *Logistics management.

The study determines and evaluates the advantages and disadvantages of the DoD Coordinated Procurement Program; it evaluates the effect of current item management coding policy; develops criteria for establishing/continuing/modifying/terminating coordinated procurement assignments; and recommends changes to DoD Instructions.

AD-780 735/7GA PC$4.00/MF$1.45
Army Engineer Waterways Experiment Station Vicksburg Miss

APPLICATION OF FIELD AVAILABLE MATERIALS TO FORTIFICATIONS.
Final rept. Jul 72-Sep 73,
G. Lee Carre. May 74, 77p Rept no. AEWES-TR-N-74-4

Descriptors: *Forward areas, *Military facilities, *Protective equipment, *Fortifications, Ammunition containers, Shipping containers, Landing mats, Shelters, Construction, Construction materials.
Identifiers: *Sandbags.

The report presents the results of an investigation conducted to collect, document, and evaluate data on field fortifications constructed from materials normally used in other military applications. As a result of reviewing the collected data, it was apparent that materials such as landing mats, shipping containers, U-shaped steel pickets, POL drums, culvert pipe sections, and ground membranes had widespread application in a variety of troop-type construction. Examples were found of protective structures which, instead of providing protection, probably were a hazard to occupants. Two of the materials, M8A1 landing mat and U-shaped steel pickets, were commonly used as beams to support sandbag roof cover for protective structures. Recommendations are made as to the proper use of these two (and other) materials, and suggestions are offered which should improve their future use if employed in similar application: (Modified author abstract)

AD-780 739/9GA PC$4.00/MF$1.45
Army Land Warfare Lab Aberdeen Proving Ground Md
FIELD FORTIFICATION KIT.
Final rept.,
Joseph T. Gurganious. Mar 74, 85p Rept no. LWL-TR-74-24

Descriptors: *Kits, *Field equipment, *Revetments, Modular construction, Fortifications, Portable equipment, Panels, Aluminum, Rope, Mechanical cables, Assembly, Reliability, Safety.
Identifiers: *Field fortification kits.

The report describes the development and feasibility test of a universally adaptable modular Field Fortification Kit System which appears to offer, when fully developed, a solution to most of the Army's needs for forward area bunkers and revetments. The Field Fortification Kit, when used in multiple kit quantities, provides a family of standardized bunker and revetment structures. A kit is essentially an assortment of corrugated aluminum panels of various lengths with a specified number of galvanized wire rope cables. The wire rope cables are used to assemble the panels into double-wall enclosures (panel bays) in making bunkers and/or revetments. The panel bays, connected in the desired bunker floor plan or revetment wall configuration, are filled with dirt or sand. To make a bunker, roof sheet panels are placed to span the earth filled walls, and an appropriate thickness of sandbags placed thereon. The Field Fortification Kit System was found to be feasible and practical, and to provide protection against 81mm mortar fire. (Modified author abstract)

AD-780 742/3GA PC$3.00/MF$1.45
Army Land Warfare Lab Aberdeen Proving Ground Md
NONSKID, ALL SIZE FOOTWEAR SPIKES.
Final rept.,
Peter B. Ferrara. Apr 74, 9p Rept no. LWL-TR-74-47

Descriptors: *Footwear, *Spikes, Tungsten, Skidding, Ice.

The report covers the development of a means to provide positive footing for personnel who must walk or perform duties on ice-covered or other slippery surfaces. These spikes are not a substitute for crampons. (Author)

AD-780 743/1GA PC$3.00/MF$1.45
Army Land Warfare Lab Aberdeen Proving Ground Md
IMPROVED TENT FOR M-577 COMMAND TRACK.
Final rept.,
Norman P. Leibel. Apr 74, 15p Rept no. LWL-TR-74-48

Descriptors: *Tents, *Field equipment, *Command and control systems, Assembly, Release mechanisms, Weight, Extendable structures, Reliability, Test methods.
Identifiers: M-577 command tracks, Tent extensions.

The M-577A1 Light-Tracked Command Post Carrier is designed for use as a highly mobile field command post. The tent extension, erected from the rear of the vehicle, increases working space and provides weather and blackout protection. The tent extension was improved by simplifying the erection and dismantling procedures, providing a quick release capability and reducing overall weight of the tent extension. The improved M-577 tent extension is lightweight, quickly erectable and can be detached from the M-577 track within minutes. In adddition the structure can be left freestanding when the command track is detached. Presently four prototype units are being evaluated. (Modified author abstract)

AD-780 798/5GA PC$4.00/MF$1.45
Logistics Management Inst Washington D C
BETTER UTILIZATION OF PRINCIPAL AND SECONDARY ITEM STOCKS FOR BOTH LOGISTICS SUPPORT AND PRODUCTION REQUIREMENTS.
May 74, 80p Rept no. LMI-73-18
Contract SD-321

Descriptors: *Logistics support, Logistics planning, Naval logistics, Inventory control, Contracts, Government procurement, Depots.
Identifiers: *Logistics management, Trident program, Trident missiles.

The study examines two methods for the Navy's Strategic Systems Project Office (SSPO) to better use government-owned principal and secondary items for both logistic support purposes and for production contracts: establish contractor depot support that would provide for contractor-maintained buffer stock of parts for logistics support and for use in later production if not used for lOGISTICS SUPPORT. Develop standard practices and procedures to use long supply as government-furnished material in production contracts. A concept called Integrated Production and Depot Support (IPADS) is analyzed and recommended for use by SSPO in the Trident program and by other DoD managers where applicable. The findings and recommendations are applicable to OSD and the Military Services. (Modified author abstract)

AD-780 800/9GA PC$3.75/MF$1.45
Army Construction Engineering Research Lab Champaign Ill
WOOD DESIGN PARAMETERS FOR THEATER OF OPERATIONS APPLICATIONS.
Final rept.,
R. H. Heidersbach, Jr. May 74, 55p Rept no. CERL-TR-M-80
Report of AFCS-Design Parameters for T.O. Material Applications.

Descriptors: *Military facilities, *Forward areas, *Construction materials, *Wood, Lumber, Construction, Specifications, Stresses.
Identifiers: Design parameters.

The report presents the results of a study of the wood design parameters used in developing standard and non-standard designs for use in theater of operations (T.O.) construction. Of prime importance was the requirement to determine if present design guidance for wood structures in the T.O. is adequate, taking into consideration the diverse environments wherein T.O. structures may be built. Another consideration was to determine if present wood design parameters should be altered in view of the limited requirements for short-term T.O. applications. Recommended alterations to present design and supply procedures are presented in tabular form along with explanations as to why present practice should be changed. (Author)

AD-780 809/0GA PC$6.50/MF$1.45
Defense Systems Management School Fort Belvoir Va
CONTROL OF MAJOR CHANGES TO AND RESULTANT COST GROWTH IN WEAPON SYSTEMS ACQUISITION CONTRACTS.
Doctoral thesis,
Arthur Charles Meiners, Jr. 18 Feb 74, 260p

Descriptors: *Weapon systems, *Government procurement, *Contracts, Jet fighters, Acquisition, Department of Defense, Management planning and control, Cost analysis, Logistics planning, Theses.
Identifiers: *Configuration management, *Engineering change proposals, F-111 aircraft, F-14 aircraft.

The question studied is, 'What recognizable variables induce major changes to weapon system acquisition contracts.' In answering this research question, data concerning causes of major changes are collected; some new ideas for resolving and reducing the occurrence of changes are collected from program managers; and the responses of government industry managers are compared. The sample of respondents included the government and contractor program managers and the PCO and ACO of 25 programs which are reported to Congress on the selected acquisition report (SAR). This was done by interview with the four principals of the F-111 and F-14 programs and by questionnaire from the others. (Modified author abstract)

15G. Operations, Strategy, and Tactics

AD-780 543/5GA PC$3.25/MF$1.45
Institute for Defense Analyses Arlington Va Program Analysis Div
ON A CLASS OF BINOMIAL ATTRITION PROCESSES.
Alan F. Karr. Jun 74, 55p Rept no. P-1031

Descriptors: *Warfare, *Attrition, Stochastic processes, Mathematical models, Fire support, Kill probabilities, Search theory, Approximation.

The paper provides underlying sets of assumptions and rigorous derivations of certain static combat attrition processes. Considered are a homogeneous point fire process, a heterogeneous point fire process, and an area fire process. Each set of assumptions is complete, concise, unambiguous, and as general--both mathematically and in terms of physical interpretation--as possible. Some attention is also devoted to various approximations and computational simplifications of the models presented. (Author)

AD-780 556/7GA PC$4.75/MF$1.45
Institute for Defense Analyses Arlington Va Program Analysis Div
STOCHASTIC ATTRITION MODELS OF LANCHESTER TYPE.
Alan F. Karr. Jun 74, 130p Rept no. P-1030
IDA/HQ-74-16361

Descriptors: *Warfare, *Attrition, *Lanchester equations, Stochastic processes, Mathematical models, War games, Kill probabilities.
Identifiers: Markov processes.

The purpose of the research effort summarized in the paper is to give a careful, rigorous, and unified

structure to a class of stochastic attrition models originated by F. W. Lanchester. For each of ten attrition processes are stated a concise but complete set of assumptions from which are rigorously derived the form of the resultant attrition process. These assumptions are 'micro' in viewpoint, concerning the behavior and interaction of individual combatants, but are as free from restrictive physical interpretation as possible. Each attrition process is a regular step Markov process and is characterized in terms of its jump function, transition kernel, and infinitesimal generator. Also included are several taxonomies of the processes presented. (Modified author abstract)

AD-780 635/9GA PC$8.00/MF$1.45
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Engineering
A GENERALIZED PAYOFF FOR DIFFERENTIAL GAME ROLE DETERMINATION IN A TWO AIRCRAFT COMBAT.
Master's thesis,
P. G. Jenkins. Mar 74, 96p Rept no. GA/MC/74-1

Descriptors: *Aerial warfare, *Game theory, Strategy, Mathematical models, Computerized simulation, Theses.
Identifiers: *Differential games, Two person games, Zero sum games.

The problem investigated is a method of role determination, using a general purpose of payoff, in a differential game model of aerial combat. Role determination is taken to mean a combatant's selection of a combat ovjective, based on his relative advantage. The class of game is two person, free time, zero sum and perfect information. The aircraft dynamics are restricted to constant speed in the horizontal plane. The controls for both players are limited turn rates. A fixed weapon range establishes a terminal constraint around one player. Using limits on the payoff, a game of kind is formulated to give successful termination at weapon range for both players. (Modified author abstract)

AD-780 684/7GA PC$4.00/MF$1.45
Rand Corp Santa Monica Calif
SORTIE ALLOCATION BY A NONLINEAR PROGRAMMING MODEL FOR DETERMINING A MUNITIONS MIX,
R. J. Clasen, G. W. Graves, and J. Y. Lu. Mar 74, 82p Rept no. R-1411-DDPAE
Contract DAHC15-71-C-0220

Descriptors: *Military operations, *Missions, *Nonlinear programming, Ammunition, Air to surface, Air Force operations, Naval operations, Kill probabilities, Mathematical models, Computer programming.
Identifiers: Convex programming, PL/1 programming language.

The report presents a mathematical programming approach to maximize a military objective function which is subject to resource constraints. The formulation takes account of the diminishing returns obtained with incremental capability increases, thus producing a problem of the convex programming type. A very general nonlinear programming algorithm is presented, along with a discussion of its numerical properties and a proof of its convergence for the convex programming problem. This is followed by a description of the computer input for the specific problem studied, and by an example problem with its associated computer output. An appendix details the use of the general algorithm for applications that differ from the one considered here. This usage involves altering several PL/1 procedures to the form desired.

AD-780 807/4GA PC$4.00/MF$1.45
Army Concepts Analysis Agency Bethesda Md
SENSITIVITY ANALYSIS OF SELECTED VARIABLES IN THE CEM.
Final rept.,
Carl B. Bates, and Jerry Thomas. Jan 74, 99p Rept no. CAA-TP-74-2

Descriptors: *Army operations, *Warfare, Experimental design, Mathematical models, Computerized simulation, Sampling, Game theory.
Identifiers: *Sensitivity analysis.

The designed fractional factorial experiment is presented for a five-factor experiment with each factor having two levels. The advantages of factorial experimentation over the old classical one-factor-at-a-time experimentation are briefly discussed. A computer-simulated experiment was conducted according to the design using the CONAF (Conceptual Design for the Army in the Field) Evaluation Model (CEM) and the CONAF II data deck. Results of the analyses are presented on the sensitivity of four model output variables: (1) Forward Edge of Battle Area (FEBA), (2) Blue State, (3) Red State, and (4) Blue Casualties, to change in five input factors: (1) Boundary Shift Limit, (2) Prepared Defense Threshold, (3) Indices of Firepower Potential, (4) Red Replacement Policy, and (5) Estimated Outcome Thresholds. Analyses are performed on the output data at four periods of game play (12, 24, 36, and 48 days of battle). None of the four output variables were found to be sensitive to change in the input factor Boundary Shift Limit. All four output variables, however, are sensitive to change in the Red Replacement Policy.

AD-780 880/1GA PC$8.25/MF$1.45
Modern Army Selected Systems Test Evaluation and Review Fort Hood Tex
STAFF ORGANIZATION AND PROCEDURES. PART I. EXECUTIVE SUMMARY AND MASSTER EVALUATION. PART II. TEST AND FINDINGS. APPENDIXES A AND B.
Final rept.,
Donald D. Durr, Eugene D. Cargile, and Reedie A. Stone. 10 May 74, 394p Rept no. MASSTER-Test-FM-119-Pt-1/2
See also Part 3, section 1, AD-780 881.

Descriptors: *Command and control systems, *Military organizations, *Tactical warfare, Artillery, Communications traffic, Military intelligence, Operations research.
Identifiers: *Brigade level organizations, *Integrated battlefield control systems, Masster project, Division level organizations.

The purpose of Test 119 was to experiment with and evaluate portions of the refinement of the baseline, Integrated Battlefield Control System, Division Level System Definition, Second Refinement. A secondary purpose was to develop baseline SOP's and provide them to active Army divisions pending TRADOC review and subsequent publication as doctrinal literature. The test consisted of a series of workshops and a field exercise. The report contains data on the performance of the baseline organization during normal, displacement, and destruction operations. (Modified author abstract)

AD-780 881/9GA PC$9.25/MF$1.45
Modern Army Selected Systems Test Evaluation and Review Fort Hood Tex
STAFF ORGANIZATION AND PROCEDURES. PART III. TEST DATA. SECTION I.
Final rept.,
Donald D. Durr, Eugene D. Cargile, and Reedie A. Stone. 10 May 74, 457p Rept no. MASSTER-test-fm-119-pt-3-sect-1
See also Parts 1 and 2, AD-780 880, and Part 3, section 2, AD-780 882.

Descriptors: *Command and control systems, *Military organizations, *Tactical warfare, Data processing, Artillery, Tactical communications, Communications traffic, Operations research, Electronic warfare, Military intelligence.
Identifiers: *Brigade level organizations, *Integrated battlefield control systems, *Masster project, Division level organizations.

The quantitative data collected during the conduct of test FM 119 is presented. The data is organized into the following 14 data sections: division level data, division G1, G2, G3, and G4 data, tactical command post data, alternate command post data, division artillery data, division support command data, brigade, battalion, and communications data, electronic warfare cryptologic officer (EWCO) data, and TAC SOP data.

AD-780 882/7GA PC$11.00/MF$1.45
Modern Army Selected Systems Test Evaluation and Review Fort Hood Tex
STAFF ORGANIZATION AND PROCEDURES. PART III. TEST DATA. SECTION II.
Final rept.,
Donald D. Durr, Eugene D. Cargile, and Reedie A. Stone. 10 May 74, 585p Rept no. MASSTER-test-fm-119-pt-3-sect-2
See also Part 3, section 1, AD-780 881 and Part 3, section 3, AD-780 883.

Descriptors: *Command and control systems, *Military organizations, *Tactical warfare, Data processing, Communications traffic, Military intelligence, Operations research.
Identifiers: *Brigade level organizations, *Integrated battlefield control systems, Masster project, Division level organizations.

The report presents sample questionnaires and analyses of response data collected during the conduct of test FM 119. The data is organized into the following 14 data sections: division level data, division G1, G2, G3, and G4 data, tactical command post data, alternate command post data, division artillery data, division support command data, brigade, battalion, and communications data, electronic warfare cryptologic officer (EWCO) data, and TAC SOP data.

AD-780 883/5GA PC$10.75/MF$1.45
Modern Army Selected Systems Test Evaluation and Review Fort Hood Tex
STAFF ORGANIZATION AND PROCEDURES. PART III. TEST DATA. SECTION III.
Final rept.,
Donald D. Durr, Eugene D. Cargile, and Reedie A. Stone. 10 May 74, 571p Rept no. MASSTER-test-fm-119-pt-3-sect-3
See also Part 3, section 2, AD-780 882 and Part 3, section 4, AD-780 884.

Descriptors: *Command and control systems, *Military organizations, *Tactical warfare, Data processing, Communications traffic, Military intelligence, Operations research.
Identifiers: *Brigade level organizations, *Integrated battlefield control systems, Masster project, Division level organizations.

The report presents sample questionnaires and analyses of response data collected during the conduct of test FM 119. The data is organized into the following 14 data sections: division level data, division G1, G2, G3, and G4 data, tactical command post data, alternate command post data, division artillery data, division support command data, brigade, battalion, and communications data, electronic warfare cryptologic officer (EWCO) data, and TAC SOP data.

AD-780 884/3GA PC$6.50/MF$1.45
Modern Army Selected Systems Test Evaluation and Review Fort Hood Tex
STAFF ORGANIZATION AND PROCEDURES. PART III. TEST DATA. SECTION IV.
Final rept.,
Donald D. Durr, Eugene D. Cargile, and Reedie A. Stone. 10 May 74, 238p Rept no. MASSTER-test-fm-119-pt-3-sect-4
See also Part 3, section 3, AD-780 883 and Appendix C, AD-780 885.

Descriptors: *Command and control systems, *Military organizations, *Tactical warfare, Data processing, Communications traffic, Military intelligence, Operations research.

Identifiers: *Brigade level organizations, *Integrated battlefield control systems, Masster project, Division level organizations.

The report presents sample questionnaires and analyses of response data collected during the conduct of test FM 119. The data is organized into the following 14 data sections: division level data, division G1, G2, G3, and G4 data, tactical command post data, alternate command post data, division artillery data, division support command data, brigade, battalion, and communications data, electronic warfare cryptologic officer (EWCO) data, and TAC SOP data.

AD-780 885/0GA PC$6.75/MF$1.45
Modern Army Selected Systems Test Evaluation and Review Fort Hood Tex
STAFF ORGANIZATION AND PROCEDURES. APPENDIX C. DIVISION STANDING OPERATING PROCEDURE.
Final rept.,
Donald D. Durr, Eugene D. Cargile, and Reedie A. Stone. Apr 74, 278p Rept no. MASSTER-Test-FM-119-App-C
See also Part 3, section 4, AD-780 884 and Appendix D, AD-780 886.

Descriptors: *Command and control systems, *Military organizations, *Tactical warfare, Artillery, Fire support, Tactical air support, Chemical warfare, Biological warfare, Nuclear warfare, Military intelligence, Logistics, Communications traffic, Operations research.
Identifiers: *Brigade level organizations, *Integrated battlefield control systems, Masster project, Division level organizations.

The publication is provided to prescribe procedures for division level staff organizations. It conforms to published Department of the Army doctrine as closely as possible; where deviations exist, they are a result of MASSTER findings during test FM 119. This standing operating procedure (SOP) is a set of instructions having the force of orders. It covers those features of operations that lend themselves to a definite or standardized procedure without loss of effectiveness. It is published as a recommended standard document for adaptation by U.S. Army divisions as a tactical standing operation procedure.

AD-780 886/8GA PC$4.00/MF$1.45
Modern Army Selected Systems Test Evaluation and Review Fort Hood Tex
STAFF ORGANIZATION AND PROCEDURES. APPENDIX D. STANDING OPERATING PROCEDURE - DIVISION INTELLIGENCE.
Final rept.,
Donald D. Durr, Eugene D. Cargile, and Reedie A. Stone. Apr 74, 89p Rept no. MASSTER-Test-FM-119-App-D
See also Appendix C-AD-780 885.

Descriptors: *Command and control systems, *Military intelligence, *Tactical warfare, Military organizations, Communications traffic, Operations research, Tactical reconnaissance, Combat surveillance, Tactical intelligence, Tactical communications.
Identifiers: *Brigade level organizations, *Integrated battlefield control systems, Masster project, Division level organizations.

The report establishes the organization, physical arrangement of personnel, equipment and communication terminals, functions, procedures, processes, and responsibilities of personnel in the Division G2 Section when tactical intelligence augmentation personnel are attached from the Combat Intelligence Battalion or other sources. Test 119 was conducted to evaluate portions of the Integrated Battlefield Control System, Second Refinement.

AD-781 160/7GA PC$4.00/MF$1.45
Army Foreign Science and Technology Center Charlottesville Va
MODERN CAMOUFLAGE,
F. Myshak. 25 Mar 74, 5p Rept no. FSTC-HT-23-652-73
Trans. of Tekhnika Molodezhi (USSR) n3 p9 1968.

Descriptors: *Camouflage, Infrared detection, Radar reflectors, Simulation, Translations, USSR.
Identifiers: *Painted camouflage.

The author states that at the present time painted camouflage is easily recognized on photographs, and fog and night cannot protect weapons from detection with the infra-red instruments. Many different reflectors have been developed which give bright false impulses on radar screens. Thus, it is possible to simulate targets, bridges, troop concentrations, etc. For the maximum camouflage effect, various camouflage techniques are usually used in combination.

16. MISSILE TECHNOLOGY

16B. Missile Trajectories

AD-780 945/2GA PC$13.75/MF$1.45
Naval Postgraduate School Monterey Calif
A SECOND-ORDER EPSILON METHOD FOR CONSTRAINED TRAJECTORY OPTIMIZATION.
Doctoral thesis.
Marie David Hewett. Jun 74, 213p

Descriptors: *Naval aircraft, *Aeronautics, *Guided missile trajectories, Optimization, Control theory, Partial differential equations, Inequalities, Numerical integration, Mathematical models, Maneuverability, Interception, Theses.
Identifiers: *Epsilon technique, Newton-Raphson method, Panalty functions.

A second-order epsilon method is developed for trajectory optimization problems. The method is applied to several aircraft and missile performance and air combat maneuvering problems. Heavy emphasis is placed on the realistic modeling of the flight vehicle's motion and maneuvering limitations. The proposed optimization technique, which is an extension of Balakrishnan's epsilon method, uses either the full second-order Newton-Raphson method or the 'modified' Newton-Raphson method to minimize the epsilon functional. The full Newton-Raphson method exhibits terminal convergence characteristics superior to the 'modified' method, whereas the 'modified' method is generally superior in the initial stages of a problem. An algorithm is developed which uses both techniques in a complementary way. (Modified author abstract)

16D. Missiles

AD-780 786/0GA PC$5.75/MF$1.45
Advisory Group for Aerospace Research and Development Paris (France)
LE REFROIDISSEMENT PAR RAYONNEMENT DES TUYERES PROPULSIVES (COOLING BY RADIATION FROM PROPELLANT DUCTS).
AGARDograph rept.,
J. J. Bernard, and J. Genot. May 74, 51p Rept no. AGARD-AG-184(FR)
Text in French. NATO furnished.

Descriptors: *Rocket nozzles, *Cooling, Nozzle gas flow, Heat transfer, Thermal radiation, Numerical analysis, France.

17. NAVIGATION, DETECTION, COMMUNICATIONS, AND COUNTERMEASURES

17A. Acoustic Detection

AD-780 711/8GA MF$1.45
Raytheon Co Portsmouth R I Submarine Signal Div
PROPORTIONAL BANDWIDTH SPECTRUM ANALYZER.
Final engineering rept.
24 May 74, 150p
Contract N00024-73-C-1116
Availability: Available in microfiche only.

Descriptors: *Sonar signals, *Signal processing, *Spectrum analyzers, Underwater sound, Bandwidth, Schematic diagrams.

The manual contains descriptions and schematics of the proportional bandwidth spectrum analyzer (PBSA). It contains a brief description of the overall system, more detailed functional descriptions of the parts of the system, and schematics with timing diagrams and magnetic core layouts. The manual is divided along these lines into the three parts: General information; theory of operation; and, schematics. The PBSA is a signal processing portion of a developmental device to be used for research in underwater acoustic reception.

AD-780 785/2GA PC$3.25/MF$1.45
Naval Underwater Systems Center New London Conn New London Lab
COMPUTATION OF BEAM PATTERNS AND DIRECTIVITY INDICES FOR THREE-DIMENSIONAL ARRAYS WITH ARBITRARY ELEMENT SPACINGS.
Technical rept.,
Ding Lee, and Gustave A. Leibiger. 22 Feb 74, 48p Rept no. NUSC-TR-4687

Descriptors: *Acoustic arrays, *Hydrophones, Beams(Radiation), Patterns, Beam steering, Directional, Reverberation, Excitation, Mathematical analysis, FORTRAN, Computer programs.
Identifiers: FORTRAN 5 programming language, UNIVAC 1108 computers.

The computation of beam pattern functions involves the summation of individual element responses that contain spatial and artificially induced phase delays. In this manner, the total array response to acoustic wave excitation possessing directionality characteristics can be determined. A computer program that calculates the beam pattern function for any selected section of the beam pattern is discussed. Some special features of the program are: both uniform and nonuniform spacing of hydrophones can be accommodated; either plane or spherical wave excitation can be assessed; the beam pattern can be determined for any desired array steering direction; any desired element response function can be incorporated into the beam computations; any prescribed amplitude shading technique can be applied to the array; and arbitrary single-element phase delays can be introduced into the beam computations. (Modified author abstract)

JPRS-62027 PC$4.00/MF$1.45
Joint Publications Research Service, Arlington, Va.
FUNDAMENTALS OF HYDROACOUSTICS AND HYDROACOUSTIC STATIONS,
I. K. Kolesnikova, and I. A. Rumynskaya. 17 May 74, 94p
Trans. of Osnovy Gidroakustiki i Gidroakusticheskie Stanstii, Leningrad, 1970 p224-314.

Descriptors: *Sonar, Underwater sound, Direction finding, Echo sounding, Sonar equipment, Translations, USSR.

The report contains a description of the operating principles of sonar, range of sonar stations and operations of echo sounders.

17B. Communication

AD-780 554/2GA PC$4.00/MF$1.45
Signatron Inc Lexington Mass
RECEIVER CANONIC MODELS.
Technical rept. no. 3, 8 Sep-7 Dec 73,
J. N. Pierce. May 74, 96p Rept no. TR-3 RADC-TR-74-127
Contract F30602-73-C-0206
See also report AD-777 195.

Descriptors: *Communication equipment, *Receivers, Electromagnetic compatibility, Transfer functions, Nonlinear systems, Models, Approximation.

The concept of an equivalent receiver is introduced. This receiver consists of a parallel combination of a unit-gain amplifier and a third order transfer function, with the parallel combination followed successively by a linear filter, and an ideal frequency translator. The general principles of phase-coherent measurement of this cascade are presented, including the sources of, and effects of, residual phase errors. The conceptual methods for eliminating these residual errors are also presented. It is shown, in block diagram form, how to implement the measurement principles and detailed schedmatics are given for one of the two coherent measurements. The results of experiments with this test set are presented and it is concluded that this phase-coherent test set is highly workable. A supplementary section presents information on the theoretical statistics of line-of-sight interferers. (Author)

AD-780 709/2GA PC$3.75/MF$1.45
Army Electronics Command Fort Monmouth N J
MILLIMETER WAVE COMMUNICATION STUDIES.
Technical rept.,
Vahakn Nalbandian. Jun 74, 53p* Rept no. ECOM-4224

Descriptors: *Communication and radio systems, *Radio equipment, Millimeter waves, Pulse communications, Digital systems, Tactical communications, Radiofrequency generators, Microwave receivers, Radio transmitters, Phase modulation, Modulators, Line of sight, Solid state electronics, Broadband, Low power.
Identifiers: Design.

A comprehensive review of different types of millimeter wave components was made. Different types of RF power sources are discussed and compared in detail. The design of a 15 GHz transmitter and receiver is covered. A detailed description of an in-house designed and fabricated DPSK modulator is presented. Finally, 5 km line-of-sight test results are given. (Author)

AD-780 718/3GA PC$3.00/MF$1.45
Otago Univ Dunedin (New Zealand) Dept of Physics
MAGNETOSPHERE AMPLIFICATION AND DOPPLER SHIFT OF VLF SIGNALS FROM POST HEIDEN.
Final scientific rept. Aug-Sep 72,
R. L. Dowden, L. E. S. Amon, and N. R. Thomson. 1974, 25p
Contract N00014-73-C-0368

Descriptors: *Radio transmission, Very low frequency, Wave propagation, Radio waves, Radio reception, Doppler effect, Magnetosphere, Amplification, Power spectra, Alaska, New Zealand.
Identifiers: CAPER project.

The article reports a very-low-frequency (VLF) magnetospheric transmission experiment which was conducted between Port Heiden, Alaska and Dunedin, New Zealand during August 1972.

AD-780 729/0GA PC$3.00/MF$1.45
Army Land Warfare Lab Aberdeen Proving Ground Md
AIRBORNE TV SYSTEM.
Final rept.,
Curtis L. Paxton. May 74, 12p Rept no. LWL-TR-74-63

Descriptors: *Television systems, Airborne, Combat surveillance, Civil disturbances, Disasters, Helicopters, Feasibility studies.
Identifiers: H-1 aircraft, UH-1H aircraft.

The report describes the development and test of 10 and 100 watt television transmission systems carried by helicopter. The purpose of the project was to determine whether the system meets the support-mission requirements of PSYOP warfare, and whether it can provide communications in the event of civil disaster. Transmission of both color and black-white programming material was successfully demonstrated. Test results also indicate that the 6-mile radius of ground coverage satisfied the range requirements associated with civil disaster activity. (Author)

AD-780 741/5GA PC$3.75/MF$1.45
Army Land Warfare Lab Aberdeen Proving Ground Md
REMOTE RETRANSMISSION SYSTEM C-7772/GRC.
Final rept.,
Stanley D. Peirce. Mar 74, 55p Rept no. LWL-TR-74-41

Descriptors: *Radio relay systems, Retransmission, Radio equipment, Tactical communications, Control systems.
Identifiers: AN/PRC-77, AN/VRC-12, AN/GRA-39.

The report covers the development and test of Retransmission Units, C-7772/GRC. These units, when used with the tactical radios such as the PRC-77 and VRC-12, permit a commander to maintain radio communications while at a position remote from the radios so as to minimize his situation as a potential target. The units can also be used in a field-artillery telephone net with GRA-39's to allow the field-artillery commander use of this telephone net from a remote location. Although the two-frequency techniques employed proved feasible, its implementation with existing military radios resulted in less than good performance for tactical application. Standardization of this approach by the Army is not recommended. (Author)

AD-780 744/9GA PC$3.00/MF$1.45
Army Land Warfare Lab Aberdeen Proving Ground Md
EMERGENCY DISTRESS SIGNALLING DEVICE.
Final rept.,
C. L. Paxton. May 74, 16p Rept no. LWL-TR-74-62

Descriptors: *Communication and radio systems, *Distress signals, Emergencies, Signals, Rocketborne, Radio beacons, Military requirements, Very high frequency, Parachutes, Deployment, Signals, Coding.

The report describes the development and test of a rocket-launched transmitter/base-station receiver system designed to provide emergency communications capability between isolated patrols and their parent unit up to ranges of 100 miles. Upon receipt of the transmitted signal, the receiver console located at the parent unit base station produces visible and audible output signals which indicate that a specific patrol is in need of assistance. (Author)

AD-780 805/8GA PC$4.00/MF$1.45
Naval Undersea Center San Diego Calif
IMAGE TRANSMISSION VIA SPREAD SPECTRUM TECHNIQUES.
Quarterly technical rept. no. 3, 1 Oct 73-1 Jan 74,
Robert W. Means, Jeffrey M. Speiser, and Harper J. Whitehouse. 30 Jun 74, 88p
ARPA Order-2303
See also report dated 1 Oct 73, AD-775 234.

Descriptors: *Television systems, *Spread spectrum, Images, Tactical communications, Coding, Pulse code modulation, Antijamming, Fourier transformation, Remotely piloted vehicles, Signal processing.

The paper addresses the design of a spread spectrum image transmission system to provide increased antijam protection to a television link from a small remotely piloted vehicle. Transform encoding and frame rate control may be used to remove the natural redundancy inherent in the image in order to permit the use of spread spectrum encoding for increased antijam protection. Emphasis is placed on the two-dimensional discrete cosine transform (DCT) and a hybrid DCT with differential pulse code modulation (DPCM). Both the two-dimensional DCT and the hybrid DCT/DPCM provide nearly the theoretically optimal performance of the Karhunen-Loeve transform, while permitting implementation by small, lightweight hardware in real-time. (Author)

AD-781 045/0GA PC$4.75/MF$1.45
Air Force Weapons Lab Kirtland AFB N Mex
NETWORK ANALYSIS AND THE RELIABILITY ASSESSMENT OF SYSTEMS.
Final rept. Feb 72-Apr 74,
William P. Dotson, Jr. Jun 74, 130p Rept no. AFWL-TR-74-138

Descriptors: *Communications networks, *Reliability, Systems analysis, Mathematical models, Radiation hardening, Vulnerability, Statistical analysis, Probability.
Identifiers: *Network analysis theory, ARPA computer network, Graph theory.

A self-contained treatment for the reliability assessment of systems is presented. Testing and/or analysis is used to derive estimates of subsystem reliability. Network analysis is used to determine the system reliability from the subsystem reliability. Examples of a number of applications are presented for the ARPA computer network. The problem of optimum allocation of a fixed budget in system assessment/hardening/design problems is addressed, and approaches are proposed. These methods can be used to reduce the high cost associated with system level testing. Some problems that could lead to theoretical extensions are presented, and approaches are proposed. While the technology discussed herein is slanted toward communications systems in application, it should be noted that it is in no way restricted to systems of that type. It may be applied equally well to the reliability assessment of any system which can be divided into statistically independent subsystems and described in terms which relate the system function(s) to the ability of the subsystems to perform their respective functions. (Author)

AD-781 107/8GA PC$3.25/MF$1.45
Teledyne ADCOM Northridge Calif
TELEPHONE CHANNEL SIMULATOR.
Final rept.,
Peter Olend. Mar 74, 40p RADC-TR-73-405
Contract F30602-70-C-0131

Descriptors: *Telephone equipment, *Simulators, Multichannel communications, Communication and radio systems, Mathematical models, Fourier transformation, Signal processing, Distortion.
Identifiers: Fast Fourier transform.

The Telephone Channel Simulator is a device used to impart the distortion present on a 4 kHz voice channel and 48 kHz group channel onto an analog

signal in real time. This report describes the theoretical aspects of the frequency domain design implemented to produce this distortion. For a more detailed explanation of the actual hardware and its operation, the reader is referred to the five-volume Operator's Manual for this simulator. (Author)

AD-781 109/4GA PC$5.50/MF$1.45
Raytheon Co Wayland Mass Advanced Development Lab
EHF DIGITAL RADIO SET AN/GRC-173(XW-1).
Final technical rept. on Phase 2,
Richard F. Hazel, Frederick L. Hills, and John Orecchio. Feb 74, 183p RADC-TR-74-10
Contract F30602-70-C-0063
Report on the Millimeter Wave Communications Program.

Descriptors: *Radio equipment, Extremely high frequency, Digital systems, Time division multiplexing, Data transmission systems, Broadband, Millimeter waves, Communication and radio systems.
Identifiers: AN/GRC-173(XW-1).

The report presents the design philosophy, system and unit descriptions and the test results achieved for the AN/GRC-173(XW-1) digital Radio Set. The system consists of a Digital Group, Radio Group and Orderwire Group colocated within a modified S-141 shelter, and an Antenna Group mounted externally to the shelter. The Digital Group performs the function of interfacing with a mixture of digital data sources such as secure digitized TV, videophone, TDM equipment such as the Multiplexer Set AN/GSC-24(V), and produces a high-speed (235.93 MB/S) digital data stream for transmission and reception by the Radio Group and Antenna Group as DPSK modulated signals in the 36.0 to 38.6 GHz frequency band. Detailed functional descriptions of the units comprising the Digital Group and Radio Group as well as the individual circuit cards and components are presented. (Modified author abstract)

AD-781 136/7GA PC$3.25/MF$1.45
Aerospace Corp El Segundo Calif
DIGITAL COMMUNICATION OVER ARBITRARY ADDITIVE NOISE CHANNELS.
Rept. for Nov 73-Feb 74,
Lloyd M. Nirenberg. 15 Mar 74, 49p Rept no. TR-0074(4901-02)-4 SAMSO-TR-74-141
Contract F04701-73-C-0074

Descriptors: *Data transmission systems, *Signal processing, Pulse communications, White noise, Probability density functions, Signal to noise ratio, Fading(Electromagnetic waves), Sampling, Computations.
Identifiers: Signal detection.

The report presents a simple formula for the capacity of a coherent digital communication channel operating near threshold (i.e., with very low signal-to-noise ratio (SNR)) with additive noise of arbitrary probability distribution. For coherent signals in this threshold mode, a computationally feasible formula for the probability of error (P sub e) is given, along with a simple upper bound to (P sub e). For the noncoherent threshold channel, the optimum receiver is derived for arbitrary modulations and fading. This receiver is shown to specialize to previously derived canonical forms for unmodulated signals. (Author)

AD-781 153/2GA PC$4.00/MF$1.45
Army Foreign Science and Technology Center Charlottesville Va
A METHOD OF LOWERING THE NOISEPROOFNESS THRESHOLD OF BRAOD-BAND FREQUENCY MODULATION AND PHASE MODULATION RECEIVERS,
L. Ya. Kantor, and V. L. Bykov. 5 Nov 73, 4p
Rept no. FSTC-HT-23-1723-72
Trans. of Patent (USSR) 175 089.

Descriptors: *Radio receivers, Threshold effects, Noise(Radio), Reduction, Frequency modulation, Phase modulation, Broadband, Translations, Patents, USSR.

The patent describes a system for lowering the noiseproof threshold of wideband FM and PM receivers by a relative increase in the carrier level of the signal realized after the preliminary transformation of the wideband signal into narrow band. The transformed narrow band signal feeds into two parallel filters, one of which (narrow band) admits the carrier and weakens the side frequencies and the other (wideband) uniformly weakens the entire spectrum of the narrow band FM or PM signal.

AD-916 229/8GA PC$6.00/MF$1.45
Naval Electronics Lab. Center, San Diego, Calif.
A SURVEY OF SPEECH UNDERSTANDING SYSTEMS TECHNOLOGY.
Research rept. 28 Nov 72-30 Jun 73,
Donald O. Christy. Nov 73, 57p NELC-TR-1885
Distribution Limitation now Removed.

Descriptors: *Speech recognition, Data management, *Word recognition, *Command and control systems, *Voice communications, Information processing, Marine corps, Military applications, Speech, Vocabulary, Correlation techniques, Semantics, Syntax, Signal processing, Transformations, Processing equipment, Miniaturization, Management planning andcontrol systems, Typewriters, Data processing systems, Input, Flow charting, Lexicography, Phonology, Segmented, Identification, Probability, Decision theory, Statistical processes, Algorithms, Errors, Tolerance, Reviews, Bibliographies.
Identifiers: *Speech understanding systems, VIP(Voice Information Processors), Voice information processors, *Voice entry systems, Phonemes, Design, *VES(Voice Entry Systems), *Voice controllers.

Discrete words speech understanding systems are now on the market, and within two years laboratory models of continuous speech systems with a 500-word vocabulary will be in use for data management and control systems. Design of continuous speech understanding systems is based on a mixture of direct speech processing and hypothesizing possibilities. Presently, eleven major activities are engaged in the design and development of speech understanding systems. Since all presently conceived systems are task domain bounded, future efforts will be aimed at expanding these boundaries. (Modified author abstract)

COM-74-11105/5GA PC$3.00/MF$1.45
ARINC Research Corp., Annapolis, Md.
INLAND WATERWAYS COMMUNICATIONS STUDY. VOLUME I. EXECUTIVE SUMMARY.
Final rept. 1 Jul 73-31 Mar 74.
Mar 74, 20p* 0639-01-1-1295-Vol-1 MA-RD-930-74059
Contract MA-3-36258
paper copy also available from NTIS $13.00/set of 3 reports as COM-74-11104-SET.

Descriptors: *Telecommunication, *Water transportation, Inland waterways, Commercial transportation, Communications management, Systems engineering, Radio communication, Telephone systems, Microwave communication, Communication satellites, Radio relay systems, Mississippi River, Illinois River, Ohio River, Tennessee River, Missouri River, Tombigbee River, Black Warrior River.
Identifiers: Intercoastal Waterway.

The report presents the results of a study of the communications requirements of the companies operating on the inland waterways, encompassing the Mississippi, Illinois, Ohio, Tennessee, Warrior and Missouri rivers and a portion of the Intercoastal Waterway. Industry communications requirements are presented in detail, leading to the development of several alternative system concepts for an integrated Inland Waterways Communications System. A detailed evaluation of the hypothesized alternatives is presented and the preferred system concept is recommended. The implementation characteristics of the preferred system concept are described, as are the type of organization required to operate the system and the regulatory environment in which the system will operate.

COM-74-11106/3GA PC$5.50/MF$1.45
ARINC Research Corp., Annapolis, Md.
INLAND WATERWAYS COMMUNICATIONS STUDY. VOLUME II. STUDY REPORT.
Final rept. 1 Jul 73-31 Mar 74.
May 74, 178p 0639-01-1-1295-Vol-2 MA-RD-930-74060
Contract MA-3-36258
Paper copy also available from NTIS $13.00/set of 3 reports as COM-74-11104-SET.

Descriptors: *Telecommunication, *Water transportation, Inland waterways, Commercial transportation, Communications management, Systems engineering, Radio communication, Telephone systems, Microwave communication, Communication satellites, Radio relay systems, Mississippi River, Illinois River, Ohio River, Tennessee River, Missoui River, Tombigbee River, Black Warrior River.
Identifiers: Intercoastal Waterway.

Contents:
Current status of inland waterways communications;
Requirements of the IWCS;
Estimating communications traffic on the inland waterways;
Selection and design of the improved IWCS;
Implementing the inland waterways communications system.

COM-74-11107/1GA PC$7.25/MF$1.45
ARINC Research Corp., Annapolis, Md.
INLAND WATERWAYS COMMUNICATIONS STUDY. VOLUME III. APPENDIXES.
Final rept. 1 Jul 73-31 Mar 74,
W. Kolb, D. Cornett, J. Diehl, K. Haspert, and R. Otero. May 74, 325p 0639-01-1-1295-Vol-3 MA-RD-930-74061
Contract MA-3-36258
Paper copy also available from NTIS $13.00/set of 3 reports as COM-74-11104-SET.

Descriptors: *Telecommunication, *Water transportation, Inland waterways, Commercial transportation, Communications management, Systems engineering, cost analysis, Computerized simulation, Radio communication, Telephone systems, Microwave communication, Communication satellites, Radio relay systems, Mississippi River, Illinios River, Ohio River, Tennessee River, Missouri River, Tombigbee River, Black Warrior River.
Identifiers: Intercoastal Waterway.

Contents:
Industry questionnaire;
VHF communications coverage;
Inland waterways simulation;
Other waterways communications systems;
System channel requirements;
Vendor responses;
Leased line systems cost analysis;
Microwave systems cost analysis;
Satellite systems cost analysis;
and Leased line office-to-office and office-to-vessel communications system.

JPRS-62835 PC$3.00/MF$1.45
Joint Publications Research Service, Arlington, Va.
NEW AUTOMATIC CHANNEL SWITCHING TELEGRAPH STATIONS,
Ya. E. Krustynysh, M. Ya. Eliseeva, and G. Kh. Khusid. 20 May 74, 16p

Trans. of Novye Avtomaticheskie Telegrafnye Stantsii Kommutatsii Kanalov, Moscow, 1971 p1-15.

Descriptors: *Telegraph systems, Channel selectors, Telegraph equipment, Automatic control, Switching systems, Translations, USSR.

The report contains a description of the experimental model of automatic channel-switching telegraph station types ATK-20 and AT-PS TsD. Technical data and details of components are provided. The PTS-KS substation is described.

JPRS-62036 PC$3.00/MF$1.45
Joint Publications Research Service, Arlington, Va.
BASIC PROPOSITIONS FOR A SYSTEM OF AUTOMATING ZONE TELEPHONE NETWORKS,
L. D. Ilina. 20 May 74, 10p
Trans. of mono. Osnovnye Polozheniya Sistemy Automatizatsii Zonovykh Telefonnykh Setei, Moscow, 1968 p1-10.

Descriptors: *Telephone systems, Automation, Automatic control, Switching systems, Networks, Translations, USSR.

The report contains a discussion of the basic propositions of a system for automating zone telephone networks.

JPRS-62067 PC$3.75/MF$1.45
Joint Publications Research Service, Arlington, Va.
VUS-12-2 AUXILIARY AMPLIFYING STATIONS,
N. A. Grishko, and A. V. Sheremetev. 22 May 74, 70p
Trans. of mono. Vspomogatelnye Usilitelnye Stantsii VUS-12-2, Moscow, 1962 64p.

Descriptors: *Telephone repeaters, High frequencies, Multiplexing, Translations, USSR.

The report contains a description of the VUS-12-2 auxiliary amplifying stations. Basic technical parameters on the design features of the apparatus are given and the operating principles are explained.

JPRS-62079 PC$4.00/MF$1.45
Joint Publications Research Service, Arlington, Va.
S10-60 INDIVIDUAL EQUIPMENT FOR MULTICHANNEL LONG-DISTANCE COMMUNICATIONS SYSTEMS,
N. M. Driatskii, and A. I. Kharitonov. 23 May 74, 91p
Trans. of mono. Individualnoe Oborudovanie S10-60 dlya Mnogokanalnykh Sistem Dalnei Svyazi, Moscow, 1964 p1-64.

Descriptors: *Telephone equipment, Multiplexing, Multichannel telephone systems, Circuits, Translations, USSR.

The report contains a description of circuits of the S10-60 standard individual telephone channel equipment used in contemporary multichannel multiplexing systems for coaxial and symmetrical cables and radio relay lines. Basic technical data are given.

JPRS-62096 PC$3.25/MF$1.45
Joint Publications Research Service, Arlington, Va.
REMOTE MEASUREMENTS OF WIRE BROADCASTING LINES,
V. A. Nyurenberg. 28 May 74, 48p
Trans. of Mono. Distantsionnye Izmereniya Traktov Provodnogo Veshchaniya, Moscow, 1954 35p.

Descriptors: *Telecommunication, Radio broadcasting, Networks, Communication cables, Translations, USSR.

The report contains a discussion of the work of the Moscow City Radio Rebroadcasting Network with respect to measurement of quality of wire broadcasting lines in Moscow.

JPRS-62161 PC$3.75/MF$1.45
Joint Publications Research Service, Arlington, Va.
TRANSMISSION OF INFORMATION UNDER WATER,
Yu. F. Tarasyuk. 4 Jun 74, 52p
Trans. of mono. Peredacha Informatsii pod Vodoi, Moscow, 1974 p1-64.

Descriptors: *Underwater communication, *Underwater sound transmission, Data transmission, Underwater television, Underwater sound equipment, Information systems, Remote control, Telemetry, Translations, USSR.

The features of underwater data transmission using hydroacoustic signals and the results of remote measurements and telecontrol commands are discussed. Certain models of hydroacoustic apparatus used in oceanography - for mineral recovery, in the fishing industry, and underwater medicine - are described. The prospects of development of hydroacoustic systems are pointed out.

JPRS-62175 PC$3.00/MF$1.45
Joint Publications Research Service, Arlington, Va.
LASERS AND COMMUNICATIONS,
V. Sipyagin. 5 Jun 74, 8p
Trans. of Radio, Moscow (USSR) n3 p15-16 1974.

Descriptors: *Optical communication, *Lasers, Underwater communication, Space communication, Atmospheres, Translations, USSR.

The report contains an examination of the possibilities of constructing laser communications lines on the earth, underwater and in space.

N74-21803/3GA PC$6.25/MF$1.45
Analytical Systems Engineering Corp., Burlington, Mass.
THUNDERSTORMS AND GROUND-BASED RADIO NOISE AS OBSERVED BY RADIO ASTRONOMY EXPLORER I.
Final Report, 18 May - 17 Nov. 1972.
J. A. Caruso, and J. R. Herman. 5 Apr 74, 63p
NASA-CR-138999
Contract NAS5-23121
Subm-Submitted for Publication.

Descriptors: *Radio astronomy explorer satellite, *Radio frequency interference, *Thunderstorms, Contours, High frequencies, Mapping, Noise intensity, Oceans, Signal to noise ratios.

For abstract, see STAR 1213

N74-21805/8GA PC$6.75/MF$1.45
City Coll. of the City of New York. Communications Systems Lab.
DELTA MODULATION.
Final Report, 1 Jan. - 31 Dec. 1973.
D. L. Schilling. 31 Dec 73, 75p NASA-CR-134257
Contract NGR-33-013-063

Descriptors: *Algorithms, *Delta modulation, *Digital filters, *Error correcting devices, *Video data, Adaptive filters, Data links, Phase locked systems, Pulse code modulation.

For abstract, see STAR 1213

PATENT-3 792 358 Not available NTIS
Department of the Air Force Washington D C
SINGLE CYCLE TRANSMITTER.
Patent,
Edward A. Lewis, John E. Rasmussen, and James R. Stahmann. Filed 15 Dec 72, patented 12 Feb 74, 7p Rept nos. PAT-APPL-315 745,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Radio transmitters, *Patents, Very low frequency, Low frequency, Pulses, Radiation, Thyratrons, Semiconductor diodes, Pulse generators.
Identifiers: PAT-CL-325-128.

The patent describes a single cycle transmitter at low and very low frequencies which operates with an electrically short antenna. The transmitter produces an extremely short pulse of approximately one cycle duration. In response to a trigger signal, the transmitter's thyratron directly switches the antenna driving voltage, producing the first half cycle of a radiation pulse. The second half cycle is produced when diodes conduct. During this time, the thyratron deionizes, cutting off radiation.

PATENT-3 792 363 Not available NTIS
Department of the Air Force Washington D C
CONTROLLABLE EDGE SHARPENING SYSTEM FOR TIME SEQUENTIAL SIGNALS.
Patent,
Radames K. H. Gebel, and Henry E. Fettis. Filed 26 Apr 72, patented 12 Feb 74, 18p Rept nos. PAT-APPL-247 775,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Signal processing, *Patents, Video signals, Signals, Sequential, Shape, Leading edges, Trailing edge, Resolution, Transfer functions.
Identifiers: *Time sequential signals, PAT-CL-328-164.

A time sequential signal having deficient leading and trailing edge characteristics is modified according to the patent by a system having a third order network with a transfer function. The system provides an improved signal having leading and trailing edge characteristics suitable for utilization.

17D. Electromagnetic and Acoustic Countermeasures

AD-781 093/0GA PC$3.00/MF$1.45
Dayton Univ Ohio Research Inst
THE HUMAN ENGINEERING ELECTRONIC COUNTERMEASURES SIMULATOR.
Final rept.,
John P. Lyons, and Aldo Gillio. Sep 72, 21p
AMRL-TR-72-59
Contract F33615-71-C-1113

Descriptors: *Electronic countermeasures, *Simulators, Signal generators, Video signals, Electronic warfare, Radar jamming, Radar decoys, Data reduction.
Identifiers: AN/ALQ-T4, IBM 360/40 computers.

The report describes the Human Engineering Electronic Countermeasures (HEECS) and the procedures used in its operation. The basis of the HEECS is an AN/ALQ-T4 Electronic Warfare Crew Station (T-4) trainer reconfigured to operate as a research tool. The trainer interfaces with an IBM 360, model 40, which controls presentation of threat signals to the subject and serves as an automatic data collection system. The IBM 360 also simulates on-board digital computers and digital logic circuitry for specific pieces of equipment. The report is intended to acquaint the research, design, and operational communities with the capability and flexibility of this new systems simulator. Some of the problem areas addressed are: (1) the communication problems between an analog machine with a reference voltage supply of +300 volts and a digital converter which accepts only a range of +5 to -5 volts; and (2) the problem of filtering out analog changes due to noise on the

signal, as opposed to actual changes by the subject. There is also a discussion of system-effectiveness measures used by human engineers to evaluate performance. (Author)

17E. Infrared and Ultraviolet Detection

AD-780 546/8GA PC$3.75/MF$1.45
RCA Labs Princeton N J
CHARGE-COUPLED SCANNED IR IMAGING SENSORS.
Semiannual technical rept. 29 Jun-28 Dec 73,
Elliott S. Kohn, and Melvin L. Schultz. 14 Jan 74, 65p Rept no. PRRL-74-CR-1 AFCRL-TR-74-0056
Contract F19628-73-C-0282, ARPA Order-2444

Descriptors: *Infrared detectors, *Charge coupled devices, Semiconductor devices, Schottky barrier devices, Photoconductors, Lead sulfides, Tellurides, Semiconducting films, Photosensitivity.
Identifiers: Schottky barrier diodes, Lead tellurides, Heterojunctions.

A program is in progress directed toward showing the feasibility of infrared sensitive charge-coupled imagers by constructing imaging arrays. The detectors are of both the Schottky-barrier type and the photoconductive type. The first device objective is a 64 x 1 array of palladium silicide on p-silicon Schottky-barrier diodes that couple into a three-phase CCD shift-register. Sensitivity is expected in the 2- to 3-micrometer region. Barriers produced with other metals can detect radiation in the 3- to 5-micrometer window useful for thermal imaging. New ideas are incorporated into the design so that the CCD does not have to handle the background signal even if frame comparison should be necessary. Test Schottky barriers have been made to permit measurement of sensitivity and dark current. Custom-designed circuitry has been built to provide the complex pulse waveforms required for the 64 x 1 array. (Modified author abstract)

AD-780 563/3GA PC$4.00/MF$1.45
Polytechnic Inst of New York Brooklyn
BLEACHABLE ABSORBER LASER AMPLIFIER AND DETECTOR: BALAD.
Final technical rept. 1 Jan-31 Dec 72,
James T. LaTourrette, Maurice Newstein, S. Y. Szeto, and N. Wright. Feb 74, 88p Rept no. PINYEP-74-136 RADC-TR-74-60
Contract F30602-72-C-0245, ARPA Order-1279

Descriptors: *Infrared detectors, *Infrared receivers, *Optical radar, *Optical communications, Gas lasers, Infrared lasers, Carbon dioxide lasers, Optical equipment components, Light transmission.
Identifiers: BALAD(Bleachable Absorber Laser Amplifier and Detector), Bleachable absorber laser amplifier and detector, Helium xenon lasers, Saturable absorbers, Design.

The report describes the continued development of the wide-angle, low noise BALAD receiver (Bleachable Absorber Laser Amplifier and Detector). A xenon-xenon 3.5 micrometer BALAD receiver system has been tested. Experimental results are given. The experiments were hampered by excess noise in the xenon absorber discharge. The three dimensional analysis of the propagation of coherent optical pulses with limited transverse extent, predicts a non-linear self-focussing effect. A modified design of the BALAD receiver using a geometrical loss filter based on this effect is presented and analyzed. The design would facilitate the rejection of noise from the other laser amplifier transitions. (Author)

AD-780 725/8GA PC$7.25/MF$1.45
Defense Documentation Center Alexandria Va
INFRARED DETECTORS.
Report bibliography Dec 60-Dec 73.
Jun 74, 325p* Rept no. DDC-TAS-74-25

Descriptors: *Infrared detectors, *Bibliographies, Infrared equipment, Infrared radiation, Infrared receivers, Infrared optical materials, Infrared photography, Infrared detection, Infrared phenomena, Infrared research, Infrared lasers, Abstracts.

The bibliography contains unclassified and unlimited citations on Infrared Detectors. These citations are studies and analyses pertaining to detection techniques, equipment, refrigeration systems, instrumentation, sensitivity, reliability, design, measurement, and performance engineering. Computer generated indexes of Corporate Author/Monitoring Agency, Subject, Title, and Personal Author are provided. (Author)

PATENT-3 795 811 Not available NTIS
Department of the Air Force Washington D C
METHOD AND MEANS FOR EQUALIZING THE RESPONSE OF SIGNAL CHANNELS IN A MULTIPLE CHANNEL IMPROVED SYSTEM.
Patent,
Donald E. Weir. Filed 20 Mar 73, patented 5 Mar 74, 8p Rept nos. PAT-APPL-343 061,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Infrared detectors, *Patents, Signal processing, Video signals, Response, Multiple operation, Automatic, Control.
Identifiers: PAT-CL-250-339.

The patent relates to an automatic responsivity control in a multiple channel infrared system realized by means of reference signals derived from a modulated light source. The light source illuminates both the infrared element array and a separate reference signal detector. The infrared video signal and the reference signals transmitted in each infrared system channel are passed through a variable gain amplifier. The gain of the variable gain amplifier (and hence the magnitude of the reference signal) is controlled by a circuit including a synchronous filter, a synchronous detector, a DC reference voltage source, and a voltage controlled resistor. The separate reference signal detector provides drive signals to control the synchronous filter and also provides a 180 degrees phase shifted reference signal that is used to cancel the reference signal in the output of the variable gain amplifier.

17F. Magnetic Detection

N74-22125/0GA PC$5.25/MF$1.45
Danish Meteorological Inst., Charlottenlund. Geophysics Div.
FLUXGATE SENSORS: PRINCIPLES AND PROPERTIES.
F. Primdahl. 1973, 44p R-36, ISBN-87-7478-083-2

Descriptors: *Conferences, *Magnetic permeability, *Magnetometers, *Noise intensity, *Sensitivity, *Stability tests, Data processing, Frequency response, Geomagnetism, Geophysical observatories, Magnetic coils, Magnetic cores, Magnetic recording, Temperature compensation.

For abstract, see STAR 1213

17G. Navigation and Guidance

AD-780 708/4GA PC$8.75/MF$1.45
Ohio Univ Athens Dept of Electrical Engineering
ALL-WEATHER, LOW-LEVEL NAVIGATION AND IMPLEMENTATION OF A ONE-WAY RANGING, RANGE-RANGE NAVIGATION SYSTEM.
Final rept. Oct 73-Mar 74.
Mar 74, 112p Rept no. EER-16-21 ECOM-0156-F-71
Contract DAAB07-71-C-0156
See also AD-773 047.

Descriptors: *Radio navigation, Low frequency, All weather, Navigation, Aircraft, Low level, RAdio receivers, Adaptive systems, Phase measurement, Clocks, Navigation computers, Correlation techniques.

The report contains a synopsis of a six and one-half year effort in research and development activities in low-level, all-weather aircraft navigation. Background work is described leading to the successful flight test of the low frequency direct ranging range-range navigation system developed. Theory of the TRF MLE receiver processors used in the tests is discussed and future developments suggested. A learning version of the processor using a priori information is discussed and methods for making the processor adaptive are outlined. Airborne phase measuring techniques have been investigated. Both analog and digital as well as mixed methods are considered. A digital local oscillator for a projected superheterodyne model is studied. Work on auto-correlation and statistical data collection is reported. (Modified author abstract)

AD-780 749/8GA PC$4.75/MF$1.45
Westinghouse Electric Corp Baltimore Md Systems Development Div
LAND VEHICLE NAVIGATION SYSTEM.
Technical rept.,
D. G. Kadron, and C. R. Younkin. 15 Apr 74, 129p LWL-CR-04P72
Contract DAAD05-72-C-0241

Descriptors: *Navigational aids, Ground vehicles, Armored vehicles, Dead reckoning, Self contained, Passive systems, Real time.
Identifiers: Land vehicle navigation systems.

The report is the Final Technical report describing the development and test of a Land Vehicle Navigator (LVN). The LVN is a completely self-contained and passive navigation system which can provide accurate UTM and heading information for many Army vehicles. Real-time position, accurate to 3% of distance travelled, is provided to the vehicle commander by continuously reading out and updating 8-digit UTM coordinates. A unique compensation scheme which corrects for magnetic disturbances affecting the compass provides automatic operation with no requirements for external equipment compass rose or knowledge of compass directions when calibration is required. Two LVN prototypes were designed, fabricated and tested for use with M113 and M151 vehicles. These systems are scheduled for MASSTER tests at Ft. Hood, TX in 4th Qtr FY 74. An additional effort to develop and design a technique to adapt this system to Army tanks has been successfully accomplished and is described in the Appendix of the report. (Author)

AD-780 803/3GA PC$3.25/MF$1.45
Meta Systems Inc Santa Clara Calif
PROGRESS REPORT VERIFICATION IN AN AUTOMATED OCEANIC AIR TRAFFIC CONTROL SYSTEM.
Final rept. Mar 72-May 73,
Frank V. Giallanza, Charles P. Giallanza, and James C. Brown. May 73, 46p FAA-RD-73-70
Contract DOT-FA72WA-2851

Descriptors: *Air traffic control systems, Automation, Oceans, Computer programming, Algorithms.

An algorithm was developed to verify the content of progress reports input to an automated oceanic air traffic control system. The reporting position, reporting time, flight level, next reporting fix and the pilot's estimated time of arrival at the next reporting fix is checked for consistency with the pilot's filed flight plan. (Author)

AD-780 838/9GA PC$4.00/MF$1.45
Northrop Corp Hawthorne Calif Electronics Div

OPERATIONAL EVALUATION OF AN AIRBORNE OMEGA NAVIGATIONAL SYSTEM. VOLUME II. APPENDICES.
Final rept. Jun 71-Oct 73,
R. Latchford, and R. C. Sanders. Oct 73, 86p
FAA-RD-74-10-2
Contract DOT-FA71WA-2648
See also Volume 1, AD-780 954.

Descriptors: *Hyperbolic navigation, Aircraft, Navigation, Radio navigation, Radio receivers, Very low frequency, Airborne, Atlantic Ocean, Utilization, Tables(Data).
Identifiers: Omega navigation system, AN/ARN-99.

Contents: List of flights; flight data sheets; progress reports; and operational manual.

AD-780 931/2GA PC$4.50/MF$1.45
Alabama Univ Huntsville
MODIFICATION OF THE EAR SIMULATION PROGRAMS FOR COMMAND GUIDANCE STUDIES AND DISCUSSION OF TESTS FOR SYSTEM EVALUATION. VOLUME II.
Interim technical rept. 18 May 73-15 Mar 74,
Robert J. Polge, B. K. Bhagavan, and Louis Callas. May 74, 119p Rept no. UAH-RR-153
Contract DAAH01-71-C-1181

Descriptors: *Command guidance, *Radar, Computerized simulation, Digital computers, Digital simulation, Arrays, Computer programming, Computer programs, Analog to digital converters, Modification, Experimental design, Moving target indicators, Ground clutter, Radar tracking, Aircraft.
Identifiers: Experimental array radar.

The report consists of two parts. The first part is concerned with command guidance investigation. After a brief review of the existing simulation programs and of the guidance requirements, it becomes clear that faster simulation programs must be developed in view of command guidance investigation. Since most of the computation time is spent in the simulation of the analog filters, the simplification proceeds in two steps: (1) combination of the linear filters and (2) elimination of the combined filter. Part II is concerned with the design of experiments. Emphasis is on the test philosophy for testing an MTI radar in the presence of heavy ground clutter. The tests are divided into two parts: (1) calibration tests or static tests and (2) moving target or dynamic tests. (Modified author abstract)

AD-780 944/5GA PC$12.75/MF$1.45
Naval Postgraduate School Monterey Calif
OPTIMUM POSITION ESTIMATION FOR OMEGA.
Doctoral thesis,
Cecil Jerome Waylan. Jun 74, 194p

Descriptors: *Hyperbolic navigation, Very low frequency, Mathematical models, Phase, Velocity, Variations, Position finding, Optimization, Monte Carlo method, Theses.
Identifiers: *Omega navigation system.

Omega is a worldwide VLF navigation system which uses phase differencing techniques. The VLF signals of Omega are perturbed by phase uncertainties caused by factors such as diurnal effects which are quite predictable and other factors which are not so predictable. This dissertation models the effective phase velocity uncertainties which result from the less predictable phase uncertainties as jointly Gaussian perturbations to the phase velocities. This approach of modeling VLF propagation for Omega has not previously been taken. The more predictable factors are incorporated into determination of the mean values of the phase velocities. This model allows any interfrequency and interstation correlation to the phase disturbances of Omega to be readily taken advantage of to improve the estimation performance. From this model, the maximum likelihood position estimation equations are derived for Omega with an arbitrary number of frequencies. (Modified author abstract)

AD-780 954/4GA PC$3.25/MF$1.45
Northrop Corp Hawthorne Calif Electronics Div
OPERATIONAL EVALUATION OF AN AIRBORNE OMEGA NAVIGATION SYSTEM. VOLUME I. BACKGROUND AND RESULTS.
Final rept. Jun 71-Oct 73,
R. Latchford, and R. C. Sanders. Oct 73, 43p
FAA-RD-74-10-1
Contract DOT-FA71WA-2648
See also Volume 2, AD-780 838.

Descriptors: *Hyperbolic navigation, Aircraft, Navigation, Radio navigation, Radio receivers, Very low frequency, Airborne, Atlantic Ocean, Utilization.
Identifiers: Omega navigation system, AN/ARN-99.

The report covers the evaluation of the Omega Navigation System for aircraft utilization on routes traversing the North Atlantic from the East coast of the United States to Europe. The user equipment was a commercial version of the AN/ARN-99 which is an automatic computerized Omega receiver designed for airborne use and was installed on a DC-8 type aircraft. The principal areas of interest in this evaluation were operational utility, signal reliability and track comparison with other aids available. The Omega system demonstrated its ability to provide smooth bounded position information in a varying and somewhat limited signal environment due to a transitional transmitter configuration. (Author)

AD-780 959/3GA PC$4.00/MF$1.45
National Aviation Facilities Experimental Center Atlantic City N J
DISTANCE MEASURING EQUIPMENT TRAFFIC-LOADING CAPACITY INVESTIGATION.
Final rept. Jul-Oct 73,
Harold Postel. Jun 74, 96p Rept no. FAA-NA-73-105 FAA-RD-74-93

Descriptors: *Air traffic control systems, *Distance measuring equipment, Interrogator transmitters, Radio beacons, Air traffic, Predictions, Counting methods.

The report covers findings of the distance measuring equipment (DME) traffic counts from selected facilities. The data are to provide a basis for estimating present and future DME traffic-handling capabilities. DME traffic counts were conducted at the following facilities: Miami, Florida; Atlanta, Georgia; Robbinsville, New Jersey; Gardner, Massachusetts; Long Beach, California; Los Angeles, California; Oakland, California; Nottingham, Maryland; and Modena, Pennsylvania. The Miami, Florida, VORTAC showed the greatest amount of DME traffic; approaching 56% of capacity during peak periods. (Author)

AD-780 984/1GA PC$5.00/MF$1.45
Collins Radio Co Cedar Rapids Iowa
RIVER AND HARBOR AID TO NAVIGATION SYSTEM (RIHANS) PHASE 1-C; SYSTEM DEFINITION. VOLUME I. SYSTEM DESCRIPTION.
Final rept. Jul 72-Apr 73,
E. Frye, R. McLaughlin, J. Dedich, W. Laubengayer, and G. Sellers. Nov 73, 151p* Rept no. 523-0765206-00181M-Vol-1
Contract DOT-CG-21411-A
See also Volume 2, AD-780 985.

Descriptors: *Hyperbolic navigation, *Navigational aids, Ships, Surface navigation, Radio beacons, Microwave equipment, All weather, Radio navigation, Radio receivers, Radio transmitters, Short range(Distance), Systems engineering, Rivers, Harbors, Inland waterways, Position finding.
Identifiers: RIHANS(River and Harbor Aid to Navigation Systems), River and harbor aid to navigation systems, Lake Erie, Galveston Bay, Houston ship channel, Detroit River.

The Coast Guard has initiated development of the River and Harbor Aid to Navigation System (RIHANS), an all-weather, short-range precision navigation system for use in harbors and harbor entrances. This report covers the results of the Collins-proposed RIHANS Phase 1, System Refinement Analysis and Technical Definition. The results provide equipment configuration, deployment configuration, cost projection, and accuracy analysis of the approach proposed to meet RIHANS requirements. The system described in this report is basically a short pulse microwave beacon system. Hyperbolic lines of position are generated by these beacons in a manner similar to the LORAN Systems. (Author) Portions of this document are not fully legible.

AD-780 985/8GA PC$4.00/MF$1.45
Collins Radio Co Cedar Rapids Iowa
RIVER AND HARBOR AID TO NAVIGATION SYSTEM (RIHANS) PHASE 1-C; SYSTEM DEFINITION. VOLUME II. SYSTEM DEPLOYMENT.
Final rept. Jul 72-Apr 73,
E. Frye, R. McLaughlin, J. Dedich, W. Laubengayer, and G. Sellers. Nov 73, 83p Rept no. 523-0765206-00181M-Vol-2
Contract DOT-CG-21411-A
See also Volume 1, AD-780 984 and Volume 3, AD-780 989.

Descriptors: *Hyperbolic navigation, *Navigational aids, Ships, Surface navigation, Radio beacons, Microwave equipment, Deployment, All weather, Radio navigation, Radio transmitters, Short range(Distance), Systems engineering, Rivers, Harbors, Inland waterways, Sites, Site selection, Specifications.
Identifiers: RIHANS(River and Harbor Aid to Navigation Systems), River and harbor aid to navigation systems, Lake Erie, Galveston Bay, Houston ship channel, Detroit River.

Contents:
Service segment deployment;
Service segment station locations;
System performance capability. Portions of this document are not fully legible.

AD-780 986/6GA PC$4.75/MF$1.45
Collins Radio Co Cedar Rapids Iowa
RIVER AND HARBOR AID TO NAVIGATION SYSTEM (RIHANS) PHASE 1-C; SYSTEM DEFINITION. VOLUME IV. COST.
Final rept. Jul 72-Apr 73,
E. Frye, R. McLaughlin, J. Dedich, W. Laubengayer, and G. Sellers. Nov 73, 130p Rept no. 523-0765206-00181M-Vol-4
Contract DOT-CG-21411-A
See also Volume 3, AD-780 989 and Volume 5, AD-780 987.

Descriptors: *Hyperbolic navigation, *Navigational aids, Ships, Surface navigation, Radio beacons, Microwave equipment, All weather, Radio navigation, Radio receivers, Radio transmitters, Short range(Distance), Systems engineering, Costs, Position finding, Rivers, Harbors, Inland waterways, Automatic.
Identifiers: RIHANS(River and Harbor Aid to Navigation Systems), River and harbor aid to navigation systems.

The report submits pricing for the Service and User Segments of the RIHANS program. The pricing satisfies the Phase I requirements of the RIHANS program and the guidelines established by the US Coast Guard. It is the intent to illustrate as much cost visibility as possible to enable mutual in-depth evaluation of the costs. Initial cost estimating was performed by the RIHANS Program Engineering Staff. The estimating was accomplished primarily on a quantity one basis. Careful

review was given to this estimate, as it was the basis for Manufacturing estimates in the higher quantities involved. The end product has Manufacturing build rates and variances applied. These equipments are quoted in terms of average man-hours and rates as this effort is a cost projection.

AD-780 987/4GA PC$5.00/MF$1.45
Collins Radio Co Cedar Rapids Iowa
RIVER AND HARBOR AID TO NAVIGATION SYSTEM (RIHANS) PHASE 1-C; SYSTEM DEFINITION. VOLUME V. REFERENCE PAPERS.
Final rept. Jul 72-Apr 73,
E. Frye, R. McLaughlin, J. Dedich, W. Laubengayer, and G. Sellers. Nov 73, 154p Rept no. 523-0765206-00181M-Vol-5
Contract DOT-CG-21411-A
See also Volume 4, AD-780 986.

Descriptors: *Hyperbolic navigation, *Navigational aids, Ships, Surface navigation, Radio beacons, Microwave equipment, All weather, Radio navigation, Short range(Distance), Systems engineering, Rivers, Harbors, Inland waterways, Radio transmission, Position finding, Errors, Display systems.
Identifiers: RIHANS(River and Harbor Aid to Navigation Systems), River and harbor aid to navigation systems.

The volume documents a series of analyses made in support of the system refinement task of the RIHANS study. As such, it contains the technical background leading to selection of major system parameters. The volume is organized into the major sections as indicated in the table of contents, with each section containing a number of papers pertinent to that area. Papers used as references are referred to by the section number in which they appear.

AD-780 989/0GA PC$7.25/MF$1.45
Collins Radio Co Cedar Rapids Iowa
RIVER AND HARBOR AID TO NAVIGATION SYSTEM (RIHANS) PHASE 1-C; SYSTEM DEFINITION. VOLUME III. DESIGN REQUIREMENTS.
Final rept. Jul 72-Apr 73,
E. Frye, R. McLaughlin, J. Dedich, W. Laubengayer, and G. Sellers. Nov 73, 308p Rept no. 523-0765206-00181M-Vol-3
Contract DOT-CG-21411-A
See also Volume 2, AD-780 985 and Volume 4, AD-780 986.

Descriptors: *Hyperbolic navigation, *Navigational aids, Ships, Surface navigation, Radio Beacons, Microwave Equipment, All weather, Radio navigation, Radio receivers, Radio transmitters, Short range(Distance), Systems engineering, Specifications, Position finding, S band, Omnidirectional antennas, Rivers, Harbors, Costs, Position finding, Inland waterways.
Identifiers: RIHANS(River and Harbor Aid to Navigation Systems), River and harbor aid to navigation systems.

The paper describes the developmental system requirements for an S-band, single-frequency navigation method titled 'Rivers and Harbors Aid to Navigation System' (RIHANS). The system is sectionalized into two major parts termed (1) service segment covering all equipments needed for land-based operation and (2) the user segment covering all equipment needed for shipboard detection and display of navigation position. The detailed breakdown is defined in section 3, Functional Requirements, of this paper. The user segment is defined for two levels of cost with the difference attributed to user accuracy and method of display. The low cost user equipment will provide 125-feet accuracy and requires manual plotting of position while the automatic user equipment will provide an accuracy of 50 feet with automatic position indications. Portions of this document are not fully legible.

AD-781 000/5GA PC$24.75/MF$1.45
TRW Systems Group Redondo Beach Calif
ARMY NAVSAT USER EQUIPMENT DESIGN STUDY. VOLUME 1.
Final rept.,
Richard E. Sansom. Feb 74, 434p Rept no. TRW-24443-6009-TU-00-vol-1 ECOM-0275-F-73-Vol-1
Contract DAAB07-73-C-0275
See also Volume 2, AD-781 001.

Descriptors: *Army operations, *Navigation satellites, User needs, Position finding, Digital computers, Input output devices, Radar jamming, Portable equipment, Mathematical models, Cost analysis.

This study presents a design concept for the Army User Equipment (AUE) Navigation Satellite Positioning System. The equipment which has been studied consists of a sequential or timeshared receiver, a digital computer, the necessary input/output consoles, the power supply, and antenna system. The study concentrates on analyzing the anticipated effects of such real world phenomena as satellite masking, foliage, attenuation, jamming, and user dynamics. The study presents a viable sequential receiver design along with requirements for the computer, power supply and antenna for both the ground (manpack and vehicle) and the helicopter user categories. The study shows that, in general, the receiver design postulated is adequate for the missions and user requirements considered. (Author)

AD-781 001/3GA PC$12.50/MF$1.45
TRW Systems Group Redondo Beach Calif
ARMY NAVSAT USER EQUIPMENT DESIGN STUDY. VOLUME 2. APPENDICES.
Final rept.,
Richard E. Sansom. Feb 74, 190p Rept no. TRW-24443-6009-TU-00-vol-2 ECOM-0275-F-73-vol-2
Contract DAAB07-73-C-0275
See also Volume 1, AD-781 000.

Descriptors: *Army operations, *Navigation satellites, User needs, Position finding, Digital simulation, Data acquisition, Phase locked communications, Computer programs, FORTRAN.
Identifiers: CDC 6500 computers.

Contents:
- Initial receiver operations;
- Analysis and simulation of the C-code acquisition time;
- Optimized acquisition parameter for the AUE receiver code lock detector;
- Transient response of the predetection filger;
- Phase lock loop computer simulation, Phase lock loop response to VCO drift;
- Performance analysis simulation program flow diagram.

PATENT-3 795 150 Not available NTIS
Department of the Air Force Washington D C
SYSTEM FOR RAPIDLY POSITIONING GIMBALED OBJECTS.
Patent,
Homer D. Eckhardt. Filed 13 Dec 72, patented 5 Mar 74, 4p Rept nos. PAT-APPL-314 622,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Stabilized platforms, *Gimbals, *Patents, Motors, Mounts, Gyroscopes.
Identifiers: PAT-CL-74-5-4.

The patent relates to a system for rapidly positioning gimbaled objects utilizing a rotating mass stabilization technique in conjunction with a brake and motor at each gimbal trunnion. With the alternate activation and energizing of a preselected motor and brake, the gimbaled object can be rapidly positioned with a minimum of torque.

PATENT-3 800 127 Not available NTIS
Department of the Air Force Washington D C
VERTICAL RATE REFERENCE COMPUTER FOR CONTROL OF A VTOL OR STOL AIRCRAFT AT A CONSTANT FLIGHT PATH ANGLE.
Patent,
Siegfried Knemeyer, and Genese L. Fileccia. Filed 11 Sep 72, patented 26 Mar 74, 13p Rept nos. PAT-APPL-288 212,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Navigation computers, *Patents, Vertical takeoff aircraft, Flight paths, Automatic pilots.
Identifiers: PAT-CL-235-150-22.

The patent relates to a computer which derives the sine of the angle between a desired flight path and the horizontal, and thereafter derives the product of the sine and the velocity vector of the aircraft as a reference vertical rate which the aircraft must maintain to hold the flight path angle constant.

17H. Optical Detection

AD-780 836/3GA PC$3.00/MF$1.45
Human Engineering Lab Aberdeen Proving Ground Md
THE EFFECTS OF MEASUREMENT RESOLUTION ON THE DESCRIPTIONS OF TARGET VISIBILITY.
Final rept.,
Donald L. Lince, and Andrew J. Eckles, III. Apr 74, 24p Rept no. HEL-TM-11-74

Descriptors: *Tanks(Combat vehicles), *Visibility, Target recognition, Resolution, Weapons, Performance(Engineering), Optical tracking.
Identifiers: HELAST(Human Engineering Laboratory Armor Systems Tests), Intervisibility, HELAST 2, Human Engineering Laboratory army systems tests.

HELAST II raised the question as to the appropriateness of using a 25-meter measurement resolution in describing tactical tank target exposures for assessing weapon effectiveness. Essentially, it appeared that a 25-meter resolution indicated half as many exposures of twice the duration as actually occurred during the HELAST II study. This report presents a reanalysis of the HELAST II continuous target description data with varying measurement resolutions in order to assess the effects they might have on apparent target visibility. The HELAST II continuous data on seven tactical tank paths, as seen from five observer positions, were analyzed with measurement resolutions of 5, 10, 15, 20, 25, and 50 meters. Additionally, the effects of target height were assessed to estimate how vehicle height might affect intervisibility of presented targets. (Author)

AD-780 897/5GA PC$3.00/MF$1.45
General Electric Co Pittsfield Mass Ordnance Systems
CAMOUFLAGE BY REFLECTANCE: REPORT OF FIELD TEST.
Technical rept.,
E. R. Hendrix. May 74, 22p Rept no. OS-74-3 LWL-CR-23C73
Contract DAAD05-73-C-0325

Descriptors: *Tanks(Combat vehicles), *Combat vehicles, *Camouflage, *Optical detection, Reflectance, Mirrors, Concealment.

A week-long evaluation of the camouflage by reflectance system was performed at the General Electric Ordnance Systems test area in Pittsfield, Mass. Testing here was done using an M113 vehicle with wheel mock-ups to simulate an M60 tank as no tank was available in this area. Further testing was performed at Aberdeen Proving Ground using an M60 tank as the test bed. There were two basic objectives to these tests: equipment evaluation from the user's standpoint, and effectiveness

of the reflectance technique in camouflaging a tank. (Author)

AD-781 122/7GA PC$4.50/MF$1.45
Boeing Aerospace Co Seattle Wash
PREDICTION OF TARGET ACQUISITION PERFORMANCE OF AERIAL OBSERVERS AND PHOTOINTERPRETERS WITH AND WITHOUT STEREOSCOPIC AIDS.
Final rept.,
Conrad L. Kraft, and Charles D. Anderson. Dec 73, 111p AMRL-TR-73-36
Contract F33615-72-C-1259

Descriptors: *Target acquisition, *Photointerpretation, *Aerial reconnaissance, *Performance(Human), Visual acuity, Photointerpreters, Color vision, Stereoscopes, Predictions, Skills, Analysis of variance, Test methods, Display systems, Images.
Identifiers: Individual differences, Imagery.

Forty-eight individuals were screened for their visual acuity, stereopsis, phorias and color perception. After brief training, their target acquisition performance on a Sonne SC-2 display, of 1:3000 scale reconnaissance imagery in near-real-time, was measured. The effects of image chromaticity and display stereoscopy were investigated. Stereoscopic skill in the Sonne viewer was measured with achromatic and chromatic transparencies of regular and irregular terrain versions of the Critical Limen Stereo Test (CLST), displayed statically and dynamically. Observer performance was correlated across tests. Large individual differences in stereoscopic skill with chromatic and achromatic imagery were found. Chromostereopsis appeared to be a factor contributing to these differences and its measurement was necessary in maximizing predictions with chromatic imagery. (Modified author abstract)

SLA-74-141 PC$4.25/MF$1.45
Sandia Labs., Albuquerque, N.Mex. (Usa).
MATHEMATICAL MODEL FOR DETERMINING THE PROBABILITY OF VISUAL ACQUISITION OF GROUND TARGETS BY OBSERVERS IN LOW-LEVEL HIGH-SPEED AIRCRAFT.
W. H. Bradford. Apr 74, 22p
Contract AT(29-1)-789

Descriptors: (*Optical systems, *Aircraft), Aviation personnel, Distribution functions, Equipment, Mathematical models, Remote viewing equipment, Targets.

For abstract, see NSA 30 01, number 02250.

17I. Radar Detection

AD-780 549/2GA PC$4.75/MF$1.45
ITT Gilfillan Inc Van Nuys Calif
DIGITAL MOVING TARGET INDICATOR MEASUREMENTS PROGRAM.
Final rept.,
John F. Chaney. Mar 74, 129p Rept no. ITTG-4069-F RADC-TR-74-35
Contract F30602-73-C-0338

Descriptors: *Moving target indicators, Digital systems, Radar clutter, Signal processing, Measurement.
Identifiers: AN/TPN-8.

The results of a DMTI (Digital Moving Target Indicator) measurements program are reported. In this program the performance of a variety of DMTI processors was measured and compared with theoretical performance predictions. Measurements were made of the MTI improvement factor and the subclutter visibility for the case of radar set operation in a severe ground clutter environment with IF limiting of the clutter signals. Some MTI improvement factor measurements were also made for the linear system case. The effect of MTI processing on target detectability for the case of a target-in-the-clear was also measured. Some MTI performance data for the case of rain clutter was also obtained. (Modified author abstract)

AD-780 597/1GA PC$3.25/MF$1.45
Clemson Univ S C
THE OBSERVATION OF BIRDS WITH WEATHER AND AIRPORT SURVEILLANCE RADARS.
Final rept. 1 Oct 72-1 Feb 74,
Sidney A. Gauthreaux, Jr. Apr 74, 50p AFWL-TR-74-57
Grant AF-AFOSR-1974-71

Descriptors: *Search radar, *Airports, *Birds, *Detection, Bird strikes, Control, Radar reflections, Air traffic control systems, Radar landing control, Aviation safety, Migration, Counting.

The application of radar to detect, quantify, and monitor the movements of birds is emphasized. Of all the approaches currently being used to reduce the hazards that birds pose to aviation, radar techniques offer the promise of definite results. The distribution of surveillance radars at numerous locations throughout the United States, particularly in the vicinity of active airfields, adds greatly to the attractiveness of this approach. The review of radar techniques and bird migration information should greatly aid radar operators in recognizing the various types of echoes from birds displayed on weather and air traffic control radars, in estimating the numbers of birds passing overhead, and in gathering information on the altitude of the birds aloft. Use of these techniques should greatly benefit aviation interests, both civilian and military, by reducing the number of bird/aircraft collisions and improving flight safety. (Modified author abstract)

AD-780 692/0GA PC$3.00/MF$1.45
Naval Research Lab Washington D C
SOLITARY OCCUPANCY FOR UNEQUAL CELL PROBABILITIES WITH APPLICATION TO DOPPLER RADARS FOR OCEAN SURVEILLANCE.
Interim rept.,
Harold L. Stalford. 20 May 74, 25p Rept no. NRL-7708

Descriptors: *Ocean surveillance, *Doppler radar, Ships, Probability.
Identifiers: *Occupancy problems.

An occupancy problem in combinatorial theory is investigated whose solution has application in ocean surveillance. In particular, theory is developed for calculating the probability of solitary occupancy of N objects in M cells of unequal cell probabilities. For t = 2, 3,...,N the sum of the cell probabilities when all are raised to the t th power is defined as a new variable. These N-1 new variables are shown to be sufficient as arguments in representing the above probability as a polynomial equation. As an application, the theory is used to calculate the capability of a doppler radar to resolve N ship dopplers contained in the same range and azimuth cell. An integration method is also employed to calculate the same capability. The agreement is excellent between both methods. (Author)

AD-780 719/1GA PC$3.75/MF$1.45
Syracuse Univ Research Corp N Y
LINE INTRUSION DETECTOR.
Final rept.,
E. K. Stodola. May 74, 59p Rept no. SURC-TR-74-107 LWL-CR-06P73
Contract DAAD05-73-C-0782
Includes SURC-TN-73-373, Appendix A.

Descriptors: *Antiintrusion devices, *Bistatic radar, Electric wire, Radar signals, Radar transmitters, Radar receivers, Transmission lines.

Several radiating line configurations were experimentally evaluated for use in a line-type intrusion detection system. The types of radiating lines examined were Radiax cable, Goubau line and television twin lead (300 ohm). Measurements of dissipative and radiation losses were made at 140 and 915 MHz and these data are presented, together with theoretical considerations related to a line intrusion detection system. (Author)

AD-780 726/6GA PC$3.25/MF$1.45
Harry Diamond Labs Washington D C
ANALYSIS AND DESIGN OF AN OPTICAL-ANGLE MEASURING DEVICE.
Timothy F. Geiger, and Melvin E. Sword. May 73, 30p Rept no. NDL-TM-73-11

Descriptors: *Radar targets, *Angles, *Measuring instruments, Radar equipment, Photodiodes, Schematic diagrams.

The report contains the analysis and design of a unique optical-angle measuring device. This device was constructed to measure the error angle off boresight of a particular radar. Development of the device was divided into three major phases: optical design, photodiode considerations, and electronic processing. Laboratory tests of the device showed that it met and exceeded the angle accuracy requirement of plus or minus one milliradian. Additional uses for the system could include any application requiring angle alignment where it is feasible to mount a flashing light on the target to be measured. (Author)

AD-780 894/2GA PC$3.25/MF$1.45
Frank J Seiler Research Lab United States Air Force Academy Colo
EVALUATION OF AN ESTIMATOR FOR REAL-TIME MISSILE TRACKING.
Final scientific rept. Oct 73-Jun 74,
Kenneth D. Herring. Jun 74, 50p Rept no. SRL-TR-74-009

Descriptors: *Guided missiles, *Radar tracking, *Kalman filtering, Real time, Matrices(Mathematics), Mathematical models.
Identifiers: Estimation theory.

The report contains an abbreviated evaluation of a Kalman filter designed to estimate in real time the position and velocity of a missile. Most aspects of the evaluation are rather cursory. However, the evaluation of the Automatic Source Selection feature of the estimator received detailed attention. Due to computational constraints, the information from only one radar can be processed at each time instant. The Automatic Source Selection feature selects the 'best' radar. The basic logic of the feature is sound; however, several recommendations for improvement are made. Included is a recommendation to use a weighted least squares combination of the individual radar Kalman filters. It is proven that the recommended least squares estimate will always be better than the single-radar Kalman filter estimate, even for the best estimate. (Author)

AD-780 930/4GA PC$3.25/MF$1.45
Hughes Research Labs Malibu Calif
SATELLITE TARGET SIGNATURE STUDY USING CLOSE RANGE MILLIMETER WAVE IMAGING TECHNIQUES.
Semiannual technical rept. 1 Apr-31 Oct 73,
J. Mark Baird. Dec 73, 37p
Contract DAAH01-73-C-0628, ARPA Order-2320

Descriptors: *Space surveillance systems, *Millimeter waves, *Spectrum signatures, Target recognition, X band, Infrared detection.

An experimental design and test setup is described by which 94 GHz images of satellite type targets or portions thereof can be obtained at close range for the purpose of determining the effectiveness of millimeter wavelength range-doppler radar in space object imaging applications. The close range imaging technique uses two parabolic antennas which are both focused at short range on the same

target element. These antennas are then mechanically rotated together as a unit so that the rf spot in the target plane is raster scanned over the target. The received signal versus scan position is used to display the target image. First results are expected at the end of 1973. (Author)

AD-781 098/9GA PC$3.25/MF$1.45
Hazeltine Corp Greenlawn N Y
SYSTEM TRANSVERSAL EQUALIZER.
Final rept. Apr 73-Jan 74,
P. Krencik. Apr 74, 35p RADC-TR-74-49
Contract F30602-73-C-0257

Descriptors: *Radar equipment, *Electromagnetic wave filters, Radar signals, Signal processing, Processing equipment, Broadband, Pulse compression, Acoustic delay lines, Acoustic waves, Surface waves, Sidelobes, Reduction.
Identifiers: *Transversal filters, Acoustic surface waves.

The report describes the implementation, theory of operation, and performance of an adjustable, 48 tap, surface wave transversal equalizer designed for the Rome Air Development Center, Floyd Site Radar. The transversal equalizer achieves equalization of system distortion by an array of fixed taps which provide leading and lagging echoes of the main signal. Equalization is achieved by the introduction of an equal but oppositely phased echo of the main signal. This cancelling echo is continuously adjustable in amplitude and phase by front panel controls. The equalizer is capable of suppressing distortion echoes, having amplitudes up to 15 dB below the main signal, to a -40 dB level. The sidelobe level reduction applies to all echoes occurring within a 20 microsecond range window. (Modified author abstract)

AD-781 100/3GA PC$3.25/MF$1.45
Massachusetts Inst of Tech Lexington Lincoln Lab
COMPENSATION OF MULTIPATH ANGULAR TRACKING ERRORS IN RADAR.
Technical rept.,
Israel Kupiec. 20 Mar 74, 35p Rept no. TR-501
ESD-TR-74-138
Contract F19628-73-C-0002

Descriptors: *Radar tracking, Multipath transmission, Errors, Compensation, Sampling, Antenna apertures, Computerized simulation.

Multipath compensation techniques for radar applications are being evaluated. Three methods which comprise an extension of the conventional monopulse and a fourth that uses coherent samples taken across the antenna aperture were considered. The performance in the presence of a single specular reflection from the ground is compared by means of Monte Carlo computer simulations. The aperture sampling technique using a minimizing search processing is found to outperform the other methods. (Author)

AD-781 101/1GA PC$4.50/MF$1.45
Massachusetts Inst of Tech Lexington Lincoln Lab
THE BULK FILTERING, ACQUISITION, AND TRACKING SYSTEM (BATS).
Technical rept.,
Carl M. Steinmetz. 2 Oct 73, 123p Rept no. TR-510
ESD-TR-73-250
Contract F19628-73-C-0002

Descriptors: *Radar tracking, *Antimissile defense systems, *Signal processing, Guided missile detection, Radar signals, Radar equipment, Guided missiles, Radar.
Identifiers: BATS(Bulk Filtering Acquisition and Tracking Systems), Bulk filtering acquisition and tracking systems.

In the report, bulk filtering refers to simultaneous measurement of the velocity of all objects in a radar beam, and the automatic rejection of those with a velocity less than some specified amount. The Bulk filtering, Acquisition, and Tracking System (BATS) is a signal processor used with the TRADEX radar for experiments in the bulk filtering of ballistic-missile tank fragments. BATS is a part of the Designation and Discrimination Engineering Program which studies ABM radar system functions crucial to the design of future ABM systems. A detailed description of the signal-processing equipment designed and constructed for this program is presented. (Author)

SLA-74-112 PC$5.50/MF$1.45
Sandia Labs., Albuquerque, N.Mex. (Usa).
AIRCRAFT-VELOCITY MEASUREMENT THROUGH RADAR-ALTIMETER ECHO WITH NONCOHERENT DETECTION.
C. S. Williams. Mar 74, 48p
Contract AT(29-1)-789

Descriptors: (*Aircraft, *Velocity), Accuracy, Altimeters, Antennas, Doppler effect, Pulse techniques, Radar, Sound waves.

For abstract, see NSA 30 01, number 02419.

17J. Seismic Detection

AD-780 752/2GA PC$5.00/MF$1.45
Army Engineer Waterways Experiment Station Vicksburg Miss
REPORT OF SYMPOSIUM ON THE DESIGN, TESTING, AND DEPLOYMENT OF UNATTENDED GROUND SENSORS, HELD AT U. S. ARMY ENGINEER WATERWAYS EXPERIMENT STATION, VICKSBURG, MISSISSIPPI, ON 11-12 SEPTEMBER 1973,
W. G. Shockley, J. P. Sale, and W. E. Grabau. May 74, 173p

Descriptors: *Perimeters(Defense), *Antiintrusion devices, *Seismic detection, *Detectors, *Meetings, Acoustic signatures, Deployment, Transducers, Seismic waves, Seismic arrays, Target recognition.
Identifiers: *Geophones.

Contents:
- User requirements for target-classifying sensors;
- Regional design base for target-classifying sensors;
- Vehicle dynamics in target-classifier design;
- Modeling seismic signatures from vehicles;
- Multisignature vehicle discrimination;
- Measuring seismic and acoustic signatures;
- Documentation of site conditions for seismic and acoustic measurements;
- Detection capability of strain-sensitive cable sensors;
- Preliminary results from phase measurements (seismic) for target position location;
- A proposed system for predicting target time-of-arrival;
- Terrain description and mapping for sensor deployment;
- Projectile penetration studies of terminal delivery vehicle T-98WA into frozen and unfrozen soils.

AD-781 126/8GA PC$3.00/MF$1.45
Environmental Research Inst of Michigan Ann Arbor
SEISMIC DECOUPLING EXPERIMENTS.
Final rept. 15 Dec 70-31 Dec 73,
Donald A. Siekmeier. Jun 74, 8p Rept no. ERIM-197200-7-F AFOSR-TR-74-0988
Contract F44620-71-C-0033, ARPA Order-1605
See also report dated Feb 73, AD-774 192.

Descriptors: *Seismic data, *Underground explosions, *Seismic detection, Seismographs, Ground motion, Nuclear explosions, Simulation, Seismometers, Data processing.
Identifiers: Diamond Mine shot, Mine Dust shot, Dido Queen shot, Seismic discrimination.

The seismic events monitored at the Nuclear Test Site in Nevada (NTS) during the contract period and the reports presenting the results of the data analyses for those seismic events are enumerated. Pertinent information about the events and analysis is summarized. The seismic events were DIAMOND MINE HE, MINE DUST HE, DIAMOND MINE of the MIGHTY MITE series, and the DIDO QUEEN event. For purposes of comparison, data from some other events were also used in the analyses. (Author)

18. NUCLEAR SCIENCES AND TECHNOLOGY

18A. Fusion Devices (Thermonuclear)

N74-22590/5GA PC$6.25/MF$1.45
Georgia Inst. of Tech., Atlanta. School of Nuclear Engineering.
COMPARATIVE EVALUATION OF SOLAR, FISSION, FUSION, AND FOSSIL ENERGY RESOURCES, PART 3.
Final Report.
J. D. Clement, and W. A. Reupke. 20 Mar 74, 61p
NASA-CR-138117
Contract NGR-11-002-166

Descriptors: *Breeder reactors, *Energy sources, *Fissionable materials, *Nuclear research and test reactors, Nuclear fusion, Radiation hazards, Radioactive contaminants, Uranium.

For abstract, see STAR 1213

UCRL-75252 PC$4.00/MF$1.45
California Univ., Livermore (Usa). Lawrence Livermore Lab.
HELIUM DOPING OF NIOBIUM WITH TRITIUM.
R. G. Hickman. 27 Feb 74, 14p CONF-740402-6

Descriptors: (*Niobium, *Crystal doping), Alpha decay, Helium 3, Tritium.

For abstract, see NSA 30 01, number 01751.

UCRL-75596 PC$4.50/MF$1.45
California Univ., Livermore (Usa). Lawrence Livermore Lab.
CONCEPTUAL DESIGN CONSIDERATIONS FOR D-T MIRROR REACTORS WITH AND WITHOUT A FISSION BLANKET.
R. W. Moir. 1 Apr 74, 28p CONF-740402-7

Descriptors: (*Magnetic mirrors, *Design), Breeding blankets, Deuterium, Direct energy conversion, Fission, Tritium.

For abstract, see NSA 30 01, number 01752.

18B. Isotopes

KFK-1915 PC$5.50/MF$1.45
Kernforschungszentrum Karlsruhe (F.R. Germany). Inst. Fuer Neutronenphysik und Reaktortechnik.
HYDROGEN PRODUCTION FROM WATER BY REACTOR HEAT.
S. Dorner, and W. Schnurr. Feb 74, 46p
In German.

Descriptors: (*Hydrogen, *Production), Process heat reactors, Reviews.

For abstract, see NSA 30 01, number 02197.

WASH-1196(74) PC$4.00/MF$1.45
Usaec Division of Production and Materials Management, Washington, D.C.

SURVEY OF UNITED STATES URANIUM MARKETING ACTIVITY.
Apr 74, 23p

Descriptors: (*Usa, Uranium oxides u3o8), (*Uranium oxides u3o8, *Market), (*U3o8, Market), (*Uranium, Market), Nuclear fuels, Nuclear industry, Nuclear power plants, Planning, Production.

For abstract, see NSA 30 01, number 00283.

18C. Nuclear Explosions

AD-780 939/5GA PC$4.50/MF$1.45
Science Applications Inc Albuquerque N Mex
ELECTROMAGNETIC PULSE ENVIRONMENT STUDIES.
Final rept.,
R. L. Knight, E. R. Parkinson, and V. W. Pine. 28 May 74, 115p Rept no. SAI-74-502-AQ
Contract DAAG39-73-C-0131
Sponsored in part by Air Force Weapons Lab., Kirtland AFB, N. Mex.

Descriptors: *Nuclear explosions, *Electromagnetic pulses, Airburst, Finite difference theory, Maxwells equations, Approximation, Computations, Computer programs, FORTRAN.

A number of investigations related to the development of a near-surface EMP code were carried out. Important considerations in the development of a near-surface burst EMP code include the choice of coordinate system, the form of the electromagnetic field equations that is chosen for solution, the differencing scheme used to represent the field equations, and the choice of boundary conditions applied to the problem to be solved. Such considerations are also affected by requirements that the conductivity and dielectric constant have spatial structure, and that far-field predictions also be provided, either directly or by extrapolation techniques. (Modified author abstract)

AD-781 051/8GA PC$3.25/MF$1.45
Air Force Weapons Lab Kirtland AFB N Mex
SENSITIVITY OF SELF-CONSISTENT HIGH-ALTITUDE ELECTROMAGNETIC PULSE CALCULATIONS TO PREIONIZATION AND IMPROVED SOURCE AND IONIZATION MODELS.
Final rept. Mar-Dec 73,
G. H. Canavan, J. E. Brau, and L. A. Wittwer. Jun 74, 41p Rept no. AFWL-TR-74-48

Descriptors: *Nuclear explosions, *Electromagnetic pulses, *Gas ionization, High altitude, Compton scattering, Gamma ray spectra, Computer programming, Computations.
Identifiers: CHEMP computer code.

The Air Force Weapons Laboratory CHEMP code for self-consistent calculations of high-altitude electromagnetic pulse is used here to assess the energetic consequences of self-consistency, with particular attention to the alteration of the radiated electromagnetic pulse. Parametric studies indicate the sensitivity of the radiated fields to gamma spectrum, angular distribution of Compton electrons, scattering, cascading, and the reduction of radiated fields by small amounts of precursor ionization in the source region. (Author)

JPRS-62166 PC$3.00/MF$1.45
Joint Publications Research Service, Arlington, Va.
CERTAIN RESULTS OBTAINED FROM EXPERIMENTAL NUCLEAR EXPLOSIONS OF INTERNAL EFFECT IN SALT DEPOSITS,
V. P. Ilin, and V. D. Trofimov. 5 Jun 74, 8p
Trans. of Investiya Vysshikh Uchebnykh Zavedenii. Geologiya i Razvedka (USSR) n4 p74-78 1974.

Descriptors: *Nuclear explosions, *Rock salt deposits, Underground explosions, USSR, United States, Translations.

The report contains a brief outline and analysis of results from underground nuclear explosions in salt deposits, conducted in the USSR and the U.S. with reference to the conditions involved in the development of salt deposits by the technique of underground leaching.

NVO-1163-239 PC$7.60/MF$1.45
Environmental Research Corp., Las Vegas, Nev. (Usa).
PREDICTION OF GROUND MOTION CHARACTERISTICS OF UNDERGROUND NUCLEAR DETONATIONS.
Mar 74, 207p
Contract AT(29-2)-1163

Descriptors: (*Nuclear explosions, Ground motion), (*Ground motion, *Numerical solution), (*Seismic waves, *Wave propagation), Geology, Mechanical structures, Nevada test site, Rio blanco event, Rocks, Rulison event, Seismic effects, Soils, Underground explosions.

For abstract, see NSA 30 01, number 00262.

PB-233 163/5GA PC$8.00/MF$1.45
Research Inst. of National Defence, Stockholm (Sweden).
A COMPUTERIZED NUCLEAR EXPLOSION INDEX.
Tapio Tikkanen. Jun 74, 99p FOA-P-C8405-M7

Descriptors: *Nuclear explosions, *Information retrieval, *Information systems, Computer storage devices, Arithmetic and logic units, Search structuring, Computer programming, Sweden.
Identifiers: IBM 360/75 computers.

The report describes the index of nuclear explosions, designed at the Research Institute of Swedish National Defence. The index is run on a computer with the information retrieval system CORSAIR, developed at the Research Institute. Searches and input in the about 900 references (February 1974) via terminal are made by using ISIS (Integrated Scientific Information System). The report also includes users guidance, both concerning the handling of the terminal and the filling up of forms to update the index. The system is run on a computer type IBM 360/75.

PNE-G-86 PC$13.50/MF$1.45
El Paso Natural Gas CO., Tex. (Usa).
PROJECT GASBUGGY, WELL TEST DATA. VOLUME V. MAY 14, 1973--NOVEMBER 6, 1973.
1973, 210p

Descriptors: (*Gasbuggy event, *Pressure measurement), (*Natural gas, *Production), Data.

For abstract, see NSA 30 01, number 00263.

UCID-16467 PC$4.00/MF$1.45
California Univ., Livermore (Usa). Lawrence Livermore Lab.
IMPROVED ONE-DIMENSIONAL CALCULATIONS OF THE EFFECTS OF FOUR NUCLEAR EXPLOSIONS IN ALLUVIUM.
J. R. Hearst. 15 Mar 74, 18p
Contract W-7405-eng-48

Descriptors: (*Alluvial deposits, *Seismic effects), (*Nuclear explosions, Seismic waves), (*Seismic waves, *Wave propagation), Ground motion, Mathematical models, Nevada test site, Numerical solution, Underground explosions.

For abstract, see NSA 30 01, number 00264.

18D. Nuclear Instrumentation

AD-780 808/2GA PC$3.00/MF$1.45
Defence Research Establishment Ottawa (Ontario)
A LOW-RANGE EXTENSION FOR THE AN/FDR-502 RADIACMETER.
Technical note,
P. C. East, and M. A. Periard. Apr 74, 19p Rept no. DREO-TN-74-9

Descriptors: *Geiger counters, Gamma rays, Consoles, Control, Canada.
Identifiers: AN/FDR-502, Radiac detectors.

A plug-in module and detector are described which extend the range of the AN/FDR-502 Remote Reading Radiation Monitor and Alarm System from 100 mR/h down to background (10 to 15 microR/h). The detector, an 18504 Geiger-Mueller tube, is connected to the control console by a single-core screened cable which can be up to 500 feet in length. (Author)

AEEW-M-996 PC$5.00/MF$1.45
Ukaea Reactor Group, Winfrith. Atomic Energy Establishment.
PREDICTION OF PULSE FISSION CHAMBER INTEGRAL BIAS CURVES.
A. Goodings, and D. R. Bonsor. Nov 70, 37p

Descriptors: (*Neutron detection, *Fission chambers), Computer calculations, Energy losses, Fission fragments, Ionization.

For abstract, see NSA 30 01, number 00336.

CLOR-97 PC$4.25/MF$1.45
Centralne Lab. Ochrony Radiologicznej, Warsaw (Poland).
TRACK ETCH DETECTOR METHOD FOR MEASUREMENT OF RADON-222 CONCENTRATION IN AIR.
M. Biernacka, K. Mamont-Ciesla, and A. Wasilewski. 1973, 21p

Descriptors: (*Radon 222, *Radiation monitoring), (*Air, Radiation monitoring), Dielectric track detectors, Performance.

For abstract, see NSA 30 01, number 00337.

DUN-8084-B PC$5.25/MF$1.45
Douglas United Nuclear, Inc., Richland, Wash. (Usa).
FINAL REPORT, PRODUCTION TEST-326 RADIATION MEASUREMENTS IN N-REACTOR REAR PIPE SPACES.
G. L. Erickson, and W. K. Kratzer. 27 Mar 73, 43p
Contract AT(45-1)-1857

Descriptors: (*N-reactor, *Radiation detectors), Performance testing, Reactor instrumentation.

For abstract, see NSA 30 01, number 02010.

INS-TH-84 PC$4.75/MF$1.45
Tokyo Univ., Tanashi (Japan). Inst. For Nuclear Study.
CAMAC READOUT SYSTEM FOR WIRE SPARK CHAMBER.
S. Inaba, and K. Sugano. 31 Jul 73, 31p
In Japanese.

Descriptors: (*Wire spark chambers, *Readout systems), Analog-to-digital converters, Camac system, Data acquisition systems, Diagrams, Integrated circuits, Magnetostriction, Specifications, Time interval analyzers.

For abstract, see NSA 30 01, number 00424.

JAERI-M-5293
REFER TO AL GAUDREAU/MF$1.45
Japan Atomic Energy Research Inst., Tokyo.

IRRADIATION APPARATUS FOR THE CALIBRATION OF GAMMA SURVEY INSTRUMENTS.
N. Okuyama, K. Minami, S. Simizu, and S. Fukuda. Jun 73, 21p
In Japanese.

Descriptors: (*Irradiation devices, *Design), (*Survey monitors, *Calibration), Gamma radiation, Gamma sources, Radiation protection, Radium.

For abstract, see NSA 30 01, number 00454.

JAERI-M-5374 PC$4.00/MF$1.45
Japan Atomic Energy Research Inst., Tokyo.
NONLINEAR ENERGY WEIGHTING CIRCUIT USING DISCRIMINATOR BIAS MODULATION FOR NAI(TL) SCINTILLATION EXPOSURE-RATE METER.
S. Moriuchi. Aug 73, 15p
In Japanese.

Descriptors: (*Dose ratemeters, *Counting circuits), (*Solid scintillation detectors, Counting circuits), Accuracy, Energy dependence, Pulse analyzers, Sodium iodides, Stability.

For abstract, see NSA 30 01, number 00339.

JINR-P10-7723 PC$4.00/MF$1.45
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Nuclear Problems.
TWO DIMENSIONAL ANALYSIS WITH DIGITAL DISCRIMINATORS AND THE HP 2116C COMPUTERS.
R. Arl't, S. V. Medved, A. N. Sinaev, B. Khan, and Kh. Khaupt. 1974, 16p
In Russian.

Descriptors: (*Spectrometers, *Data processing), Digital systems, Hp computers, Pulse discriminators, Two-dimensional calculations.

For abstract, see NSA 30 01, number 00411.

PATENT-3 792 280 Not available NTIS
Department of the Air Force Washington D C
ISOTROPIC NEUTRON SPECTROMETER.
Patent,
Harley V. Piltingsrud. Filed 3 Nov 72, patented 12 Feb 74, 5p Rept nos. PAT-APPL-303 438,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Neutron spectrometers, *Patents, Luminescent dosimeters, Thermoluminescence.
Identifiers: PAT-CL-250-390.

The patent describes an isotropic neutron spectrometer having a plurality of radial polyethylene rods positioned in bore holes angularly spaced around a polyethylene sphere with thermoluminescent dosimeter pairs positioned at spaced intervals along the rods. A TLD pair is also located in the center of the sphere.

SGAE-2235 PC$4.25/MF$1.45
Oesterreichische Studiengesellschaft fuer Atomenergie G.M.B.H., Seibersdorf. Forschungszentrum.
AUXILIARY PROGRAM FOR MULTICHANNEL DATA PROCESSING.
W. Krotz. Jan 74, 24p
In German.

Descriptors: (*Gamma spectrometers, *Data processing), Computer codes, Multi-channel analyzers, Pdp computers.

For abstract, see NSA 30 01, number 00412.

18E. Nuclear Power Plants

AEEW-R-928 PC$4.00/MF$1.45
Ukaea Reactor Group, Winfrith. Atomic Energy Establishment.
REVIEW OF TWO-PHASE MIXING AND DIVERSION CROSS FLOW IN SUBCHANNEL ANALYSIS.
J. Weisman. Sep 73, 18p

Descriptors: (*Pwr type reactors, Fuel assemblies), (*Bwr type reactors, Fuel assemblies), (*Fuel assemblies, *Liquid flow), Configuration, Mathematical models, Mixing, Two-phase flow.

For abstract, see NSA 30 01, number 01836.

AI-AEC-12995 PC$6.00/MF$1.45
Atomics International Div., Canoga Park, Calif. (Usa).
1000-MWE LMFBR EMERGENCY SHUTDOWN SYSTEM STUDY: LITERATURE SEARCH ON EMERGENCY SHUTDOWN SYSTEM CONCEPTS.
G. B. Zwetzig. 9 Feb 72, 59p
Contract ANL 31-109-38-2436

Descriptors: (*Lmfbr type reactors, Scram), (*Scram, *Specifications), Configuration, Fbr type reactors, Performance.

For abstract, see NSA 30 01, number 01922.

ANCR-1141 PC$5.45/MF$1.45
Aerojet Nuclear CO., Idaho Falls, Idaho (Usa).
START-UP TESTS FOLLOWING ATR BERYLLIUM REPLACEMENT: CYCLE 15.
J. A. Close, N. C. Kaufman, and P. R. Napper. Apr 74, 83p
Contract AT(10-1)-1375

Descriptors: (*Atr reactor, *Neutron reflectors), Beryllium, Reactor kinetics, Reactor maintenance, Reactor start-up, Testing.

For abstract, see NSA 30 01, number 01976.

ANCR-1143 PC$5.45/MF$1.45
Aerojet Nuclear CO., Idaho Falls, Idaho (Usa).
1-1/2-LOOP SEMISCALE ISOTHERMAL TEST PROGRAM: PROGRAM AND SYSTEM DESCRIPTION IN SUPPORT OF EXPERIMENT DATA REPORTS.
S. A. Naff, and P. A. Pinson. Feb 74, 45p
Contract AT(10-1)-1375

Descriptors: (*Pwr type reactors, *Blowdown), (*Eccs, *Performance testing), Configuration, Mockup.

For abstract, see NSA 30 01, number 01860.

ANCR-1147 PC$5.45/MF$1.45
Aerojet Nuclear CO., Idaho Falls, Idaho (Usa).
EXPERIMENT DATA REPORT FOR 1-1/2 LOOP SEMISCALE SYSTEM ISOTHERMAL TEST 1014.
E. M. Feldman, and P. A. Pinson. Mar 74, 52p
Contract AT(10-1)-1375

Descriptors: (*Pwr type reactors, Blowdown), (*Blowdown, *Fluid flow), Hydraulics, Loss of coolant, Mockup, Primary coolant circuits, Reactor safety, Testing.

For abstract, see NSA 30 01, number 01861.

ANL/EBR-81 PC$5.50/MF$1.45
Argonne National Lab., Ill. (Usa).
PROGRAMS FOR DATA MANIPULATION AND ANALYSIS ON THE EBR-II SIGMA 5 COMPUTER.
H. A. Larson. Feb 74, 49p

Descriptors: (*Ebr-2 reactor, *Data acquisition systems), Analog computers, Computer codes, Data processing, On-line systems.

For abstract, see NSA 30 01, number 01927.

ANL-8065 PC$4.00/MF$1.45
Argonne National Lab., Ill. (Usa).
NONLINEAR DYNAMIC RESPONSE OF REACTOR-CORE SUBASSEMBLIES.
J. M. Kennedy. Jan 74, 48p
Contract W-31-109-eng-38

Descriptors: (*Lmfbr type reactors, Fuel assemblies), (*Fuel assemblies, *Failures), Computer codes, Deformation, Fbr type reactors, Fuel pins, Fuel-coolant interactions, Reactor accidents, Reactor safety, Strains, Stresses, Two-dimensional calculations.

For abstract, see NSA 30 01, number 01925.

CONF-740401-11 PC$4.50/MF$1.45
Westinghouse Electric Corp., Madison, PA. (Usa). Advanced Reactors Div.
SAFETY RELATED CRITERIA AND DESIGN FEATURES IN THE CLINCH RIVER BREEDER REACTOR PLANT.
L. E. Strawbridge. 1973, 30p
Contract AT(11-1)-2395

Descriptors: (*Clinch river breeder reactor, *Reactor protection systems), Design, Reactor safety, Safety engineering, Specifications.

For abstract, see NSA 30 01, number 01928.

DOCKET-50133-169 PC$4.25/MF$1.45
Pacific Gas and Electric CO., San Francisco, Calif. (Usa).
HUMBOLDT BAY POWER PLANT, UNIT 3. QUARTERLY STATUS REPORT, JANUARY--MARCH 1974.
26 Apr 74, 24p

Descriptors: (*Humboldt bay reactor, *Reactor sites), Geology, Liquefaction, Mechanical structures, Reactor components, Seismology, Soils.

For abstract, see NSA 30 01, number 02188.

DOCKET-50282-229 PC$8.50/MF$1.45
Northern States Power CO., Minneapolis, Minn. (Usa).
PRAIRIE ISLAND NUCLEAR GENERATING PLANT, UNIT 1. SEMIANNUAL OPERATING REPORT NO. 1, AUGUST 9, 1973--DECEMBER 31, 1973.
28 Feb 74, 107p

Descriptors: (*Prairie island-1 reactor, *Environment), Containment, Design, Inspection, Leak testing, Nonradioactive wastes, Performance, Personnel, Radiation doses, Radiation monitoring, Radioactive waste disposal, Radioactive wastes, Reactor operation, Testing, Thermal effluents.

For abstract, see NSA 30 01, number 01862.

DOCKET-50409-111 PC$4.25/MF$1.45
Dairyland Power Cooperative, la Crosse, Wis. (Usa).
LA CROSSE BOILING WATER REACTOR. MONTHLY OPERATING REPORT FOR JANUARY 1974.
1974, 23p

Descriptors: (*Lacbwr reactor, *Environment), Radiation monitoring, Radioactive wastes, Reactor operation.

For abstract, see NSA 30 01, number 02189.

GKSS-74-E-6 PC$4.00/MF$1.45
Gesellschaft fuer Kernenergieverwertung in Schiffbau und Schiffahrt M.B.H., Geesthacht-Tesperhude (F.R. Germany).
TEMPERATURE DISTRIBUTION IN THE ELEMENTARY CELL OF THREE INTEGRAL BLOCK TYPE FUEL ELEMENTS OF DIFFERENT GEOMETRY.
K. Penndorf, and F. Schult. 1974, 16p

Descriptors: (*Gas cooled reactors, Fuel assemblies), (*Graphite moderated reactors, Fuel assemblies), (*Fuel assemblies, *Spatial distribution), Configuration, Gas flow, Heat transfer, Very high temperature.

For abstract, see NSA 30 01, number 01877.

HEDL-SA-622 PC$4.00/MF$1.45
Hanford Engineering Development Lab., Richland, Wash. (Usa).
SODIUM FIRE PROTECTION BY SPACE ISOLATION WITH INERT GAS FLOODING.
R. K. Hilliard, P. E. McPherson, and J. M. Yatabe. 1974, 15p CONF-740401-5
Contract AT(45-1)-2170

Descriptors: (*Lmfbr type reactors, Fire extinguishers), (*Fftf reactor, Fire extinguishers), (*Sodium, *Fires), (*Fire extinguishers, *Performance testing), Fbr type reactors, Inert atmosphere, Mockup, Pipelines, Reactor safety, Safety engineering.

For abstract, see NSA 30 01, number 01929.

HEDL-SA-630 PC$4.00/MF$1.45
Hanford Engineering Development Lab., Richland, Wash. (Usa).
REACTOR SODIUM COOLANT HYPOTHETICAL SPRAY RELEASE FOR CONTAINMENT ACCIDENT ANALYSIS: COMPARISON OF THEORY WITH EXPERIMENT.
P. R. Shire. Apr 74, 16p CONF-740401-7
Contract AT(45-1)-2170

Descriptors: (*Lmfbr type reactors, Primary coolant circuits), (*Primary coolant circuits, *Failures), Comparative evaluations, Fbr type reactors, Mathematical models, Mockup, Pipelines, Reactor safety, Sodium, Sprays.

For abstract, see NSA 30 01, number 01930.

HEDL-SA-647 PC$4.25/MF$1.45
Hanford Engineering Development Lab., Richland, Wash. (Usa).
ANALYTIC MODELING OF THE MARK-IIA TREAT LOOP FOR FUEL MOTION AND SODIUM EXPULSION STUDIES.
J. C. Sonnichsen, W. L. Partain, R. J. Shields, and A. E. Waltar. Apr 74, 21p CONF-740401-9
Contract AT(45-1)-2170

Descriptors: (*Fftf reactor, *Fuel-coolant interactions), Comparative evaluations, Fuel assemblies, Heat transfer, Hydraulics, M codes, Reactor accidents, Testing, Treat reactor.

For abstract, see NSA 30 01, number 01982.

HEDL-SA-651 PC$4.50/MF$1.45
Westinghouse Hanford CO., Richland, Wash. (Usa); Westinghouse Electric Corp., Madison, PA. (Usa). Advanced Reactors Div.
WEAR RESISTANT COATINGS FOR REACTOR COMPONENTS IN LIQUID SODIUM ENVIRONMENTS.
R. N. Johnson, S. L. Schrock, and G. A. Whitlow. 1974, 27p CONF-740103-3

Descriptors: (*Lmfbr type reactors, Reactor components), (*Reactor components, *Coatings), Fbr type reactors, Performance, Surface coating.

For abstract, see NSA 30 01, number 01931.

HEDL-SA-699 PC$4.25/MF$1.45
Hanford Engineering Development Lab., Richland, Wash. (Usa).
LABORATORY STUDIES ON MELTING AND GAS RELEASE BEHAVIOR OF IRRADIATED FUEL.
E. T. Weber, O. D. Slagle, and C. A. Hinman. 1974, 23p CONF-740401-12
Contract AT(45-1)-2170

Descriptors: (*Lmfbr type reactors, Fuel pins), (*Fuel pins, *Thermal stresses), (*Uranium dioxide, *Gases), Fbr type reactors, Melting, Reactor accidents, Testing, Transients.

For abstract, see NSA 30 01, number 01932.

HEDL-SA-700 PC$4.25/MF$1.45
Hanford Engineering Development Lab., Richland, Wash. (Usa).
FFTF SCALE MODEL STRUCTURAL DYNAMICS TESTS.
D. D. Stepnewski, G. L. Jr. Fox, D. E. Simpson, and R. D. Peak. Mar 74, 24p CONF-740401-10
Contract AT(45-1)-2170

Descriptors: (*Fftf reactor, *Primary coolant circuits), Mockup, Reactor core disruption, Reactor safety, Reactor vessels, Simulation, Strains, Stresses, Supports.

For abstract, see NSA 30 01, number 01983.

JAERI-M-5360 PC$4.00/MF$1.45
Japan Atomic Energy Research Inst., Tokyo.
OPERATION REPORT ON THE LOW TEMPERATURE FISSIOCHEMICAL LOOP (LTFL), 3. OPERATIONS DURING THE PERIOD OF APRIL 1971 TO MARCH 1972.
S. Sato, N. Moriyama, Y. Ikezoe, S. Shimizu, and T. Kobayashi. Aug 73, 16p
In Japanese.

Descriptors: (*Experimental channels, *Operation), Chemical dosemeters, Compressors, Ethylene, Fission fragments, In pile loops, Irradiation capsules, Low temperature, Maintenance, Nitrogen, Nitrogen oxides, Radiochemistry.

For abstract, see NSA 30 01, number 01988.

JAERI-M-5368 PC$4.75/MF$1.45
Japan Atomic Energy Research Inst., Tokyo.
BLOCK-TYPE REACTOR CORE THERMAL AND HYDRAULIC ANALYSIS CODE CROSS-2.
K. Suzuki, and Y. Miyamoto. Aug 73, 32p
In Japanese.

Descriptors: (*Htgr type reactors, *Hydraulics), (*Computer codes, *C codes), Flow rate, Fortran, Fuel elements, Fuel pins, Numerical solution, One-dimensional calculations, Reactor cores, Relaxation, Temperature distribution.

For abstract, see NSA 30 01, number 01879.

JAERI-M-5421 PC$5.50/MF$1.45
Japan Atomic Energy Research Inst., Tokyo.
OPERATION REPORT ON THE LOW TEMPERATURE FISSIOCHEMICAL LOOP (LTFL), 4. OPERATIONS DURING THE PERIOD OF APRIL 1972 TO MARCH 1973.
S. Sato, N. Moriyama, T. Kobayashi, Y. Ikezoe, and S. Shimizu. Oct 73, 49p
In Japanese.

Descriptors: (*Experimental channels, *Operation), (*Jrr-3 reactor, *Reactor operation), Capsules, Irradiation, Irradiation capsules, Irradiation devices, Maintenance, Radiochemistry, Sample preparation.

For abstract, see NSA 30 01, number 01989.

JAPFNR-144 PC$8.75/MF$1.45
Hitachi LTD., Tokyo (Japan).
TENTATIVE DESIGN OF IRRADIATION FACILITIES FOR JOYO.
Mar 72, 111p PNC-J-202-72-9-1

Descriptors: (*Joyo reactor, *Irradiation capsules), Configuration, Measuring instruments, Performance testing, Reactor experimental facilities, Specifications.

For abstract, see NSA 30 01, number 01990.

KFK-1797 PC$8.25/MF$1.45
Kernforschungszentrum Karlsruhe (F.R. Germany). Inst. Fuer Angewandte Systemtechnik und Reaktorphysik.
RADIOACTIVE REACTOR INVENTORIES AS A FUNCTION OF TIME BEFORE AND AFTER SHUT-DOWN.
H. Wild. Feb 74, 104p
In German.

Descriptors: (*Lmfbr type reactors, *Fission products), (*Pwr type reactors, Fission products), (*Bwr type reactors, Fission products), Radioactivity, Reactor shutdown.

For abstract, see NSA 30 01, number 01933.

KFK-1913 PC$7.00/MF$1.45
Kernforschungszentrum Karlsruhe (F.R. Germany).
ANALYSIS OF FUEL ROD STRESS UNDER POWER CYCLING. EVALUATION OF EXPERIMENTAL DATA FROM FR2 CAPSULE EXPERIMENTS NO. 4A, 4B, 5B, AND BR2 EXPERIMENT MOL 8B AS COMPARED TO A THEORETICAL MODEL.
A. Gerken. Feb 74, 78p
In German.

Descriptors: (*Fr-2 reactor, *Fuel pins), Burnup, Computer codes, Performance, Physical radiation effects, Stresses, Swelling, Transients.

For abstract, see NSA 30 01, number 01991.

KURRI-TR-111 PC$4.25/MF$1.45
Kyoto Univ., Kumatori, Osaka (Japan). Research Reactor Inst.
INVESTIGATION ON THE RADIOACTIVE ARGON GAS PRODUCED IN KYOTO UNIVERSITY REACTOR.
T. Tsujimoto. Oct 72, 21p
In Japanese.

Descriptors: (*Kur reactor, *Argon 41), Environment, Fission product release, Spatial distribution.

For abstract, see NSA 30 01, number 01992.

ORNL-NSIC-113 PC$12.00/MF$1.45
Oak Ridge National Lab., Tenn. (Usa).
SELECTED BIBLIOGRAPHY ON EMERGENCY CORE COOLING SYSTEMS (ECCS) FOR LIGHT-WATER-COOLED POWER REACTORS (LWRS).
W. B. Cottrell. Apr 74, 188p
Contract W-7405-eng-26

Descriptors: (*Pwr type reactors, Eccs), (*Bwr type reactors, Eccs), (*Eccs, *Bibliographies).

For abstract, see NSA 30 01, number 01838.

ORNL-NSIC-55(Vol.3) PC$10.25/MF$1.45
Oak Ridge National Lab., Tenn. (Usa).
DESIGN DATA AND SAFETY FEATURES OF COMMERCIAL NUCLEAR POWER PLANTS. VOL. III. DOCKET NO. 50-397 THROUGH 50-449.
F. A. Heddleson. Apr 74, 141p
Contract W-7405-eng-26

Descriptors: (*Usa, Nuclear power plants), (*Nuclear power plants, *Reactor protection systems), Reactor safety, Reactor sites, Safety engineering, Specifications.

For abstract, see NSA 30 01, number 01837.

ORNL-TM-4508 PC$4.25/MF$1.45
Oak Ridge National Lab., Tenn. (Usa).
BULK SHIELDING FACILITY QUARTERLY REPORT, OCTOBER, NOVEMBER, AND DECEMBER OF 1973.
S. S. III Hurt, E. D. Lance, and J. T. Thomas. Apr 74, 21p
Contract W-7405-eng-26

Descriptors: (*Bsr-1 reactor, *Reactor operation), (*Bsr-2 reactor, Reactor operation), Inspection, Reactor maintenance.

For abstract, see NSA 30 01, number 01994.

WAPD-TM-1089 PC$7.50/MF$1.45
Bettis Atomic Power Lab., Pittsburgh, PA. (Usa).
MEASUREMENT AND ANALYSIS OF PARAMETERS IN TIGHT EXP 232 TH-- EXP 235 U AND EXP 232 TH-- EXP 233 U LATTICES MODERATED WITH D SUB 2 O (LWBR DEVELOPMENT PROGRAM).
J. Jr. Hardy, J. J. Volpe, and D. Klein. Jan 74, 86p
Contract AT(36-1)-GEN-14

Descriptors: (*Lwbr type reactors, *Nuclear reactions), (*Thorium 232, Nuclear reactions), (*Uranium 235, Nuclear reactions), (*Uranium 233, Nuclear reactions), Capture, Capture-to-fission ratio, Comparative evaluations, Computer codes, Fission ratio, Monte carlo method, Neutron spectra, Reactor kinetics, Reactor lattices, Zero power reactors.

For abstract, see NSA 30 01, number 01937.

WAPD-TM-1090 PC$4.25/MF$1.45
Bettis Atomic Power Lab., Pittsburgh, PA. (Usa).
STUDY OF THE THO SUB 2 DOPPLER EFFECT IN A TIGHT EXP 235 UO SUB 2 --THO SUB 2 LATTICE MODERATED WITH D SUB 2 O (LWBR DEVELOPMENT PROGRAM).
Jan 74, 21p
Contract AT(36-1)-GEN-14

Descriptors: (*Lwbr type reactors, *Doppler coefficient), (*Thorium oxides, Doppler coefficient), Capture, Comparative evaluations, High temperature, Medium temperature, Monte carlo method, R codes, Reactor lattices, Resonance neutrons, Temperature dependence, Uranium dioxide, Zero power reactors.

For abstract, see NSA 30 01, number 01938.

WASH-1303 PC$5.45/MF$1.45
Usaec Regulatory Staff, Washington, D.C.
EFFECTS OF PLUTONIUM UTILIZATION ON THE PERFORMANCE OF LIGHT WATER REACTORS.
Apr 74, 57p

Descriptors: (*Bwr type reactors, *Fuel cycle), (*Pwr type reactors, Fuel cycle), (*Plutonium, Fuel cycle), Fuel assemblies, Mechanical properties, Physical properties, Plutonium oxides, Reactor cores, Reactor kinetics, Reviews, Uranium dioxide.

For abstract, see NSA 30 01, number 01839.

18F. Radiation Shielding and Protection

CONF-740402-9 PC$4.00/MF$1.45
Oak Ridge National Lab., Tenn. (Usa).
SERVICES TO THE CTR COMMUNITY BY THE RADIATION SHIELDING INFORMATION CENTER.
R. W. Roussin, D. K. Trubey, and B. F. Maskewitz. Apr 74, 12p

Descriptors: Gamma radiation, Information systems, Neutron reactions, Neutron transport theory, Shielding, Thermonuclear reactors.

For abstract, see NSA 30 01, number 02204.

ORNL-tr-2807 PC$3.00/MF$1.45
Commission of the European Communities, Ispra (Italy). Joint Nuclear Research Center.
ANGLE-DEPENDENT GAMMA ENERGY FLUX IN A CONCRETE SHIELD.
H. Penkuhn. 4p
Translated by R.G. Mansfield from 1974 reactor meeting of the German Atomic Forum/KTG, Berlin.

Descriptors: (*Gamma radiation, *Shielding), (*Concretes, *Photon transport), Angular distribution, Radiation flux, Scattering.

For abstract, see NSA 30 01, number 01786.

18G. Radioactive Wastes and Fission Products

BNWL-SA-4896 PC$5.50/MF$1.45
Battelle Pacific Northwest Labs., Richland, Wash. (Usa).
HIGH-LEVEL RADIOACTIVE WASTE DISPOSAL.
R. C. Liikala, R. W. McKee, and W. K. Winegardner. Jan 74, 50p CONF-740201-3
Contract AT(45-1)-1830

Descriptors: Liquid wastes, Planning, Radioactive waste disposal, Radioactive waste management, Safety, Seas, Solidification, Space, Underground disposal, Underwater, Us aec.

For abstract, see NSA 30 01, number 00994.

CONF-731117-4 PC$3.00/MF$1.45
Vyskumny Ustav Energeticky, Jaslovske Bohunice (Czechoslovakia).
USE OF INORGANIC SORBENTS FOR THE ACCUMULATION AND MONITORING OF RADIOIODINE IN GASEOUS WASTES AND IN THE VICINITY OF NUCLEAR POWER STATIONS.
E. Hladky, I. Pietrik, and J. Moravek. 15p
Translation of SM--180-79.

Descriptors: (*Iodine isotopes, *Radiation monitoring), (*Iodine, *Adsorption), (*Nuclear power plants, *Radioactive wastes), Aluminium oxides, Gaseous wastes, Iodine 131, Sensitivity, Silver nitrates, Stack disposal.

For abstract, see NSA 30 01, number 00210.

DP-1330 PC$4.00/MF$1.45
Du Pont de Nemours (E.I.) and CO., Aiken, S.C. (Usa). Savannah River Lab.
RECOVERY OF PLUTONIUM-238 FROM SCRAP MATERIALS.
E. R. Russell, and M. C. Thompson. Apr 74, 20p
Contract AT(07-2)-1

Descriptors: (*Plutonium 238, *Ion exchange), Dissolution, Fluorides, Nitric acid, Radioactive waste processing, Separation processes, Cermets, Molybdenum alloys, Plutonium oxides, Thorium oxides, Solid solutions, Zirconium oxides, Beryllium alloys, Plutonium, Plutonium alloys.

For abstract, see NSA 30 01, number 00211.

N74-22504/6GA PC$4.75/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
FEASIBILITY OF SPACE DISPOSAL OF RADIOACTIVE NUCLEAR WASTE. 2: TECHNICAL SUMMARY.
May 74, 130p NASA-TM-X-2912, E-7676

Descriptors: *Feasibility analysis, *Radioactive wastes, *Space shuttles, *Waste disposal, Actinide series, Cost analysis, Nuclear power plants, Safety factors, Solar orbits, Space transportation, Space tugs.

For abstract, see STAR 1213

PWAC-498 PC$4.75/MF$1.45
Pratt and Whitney Aircraft, Middletown, Conn. (Usa). Connecticut Advanced Nuclear Engineering Lab.
FABRICATION OF LOW DENSITY URANIUM NITRIDE FOR HIGH FISSION GAS RELEASE.
S. D. Caplow, G. W. Lindemann, and A. C. Schilling. Sep 65, 34p
Contract AT(30-1)-2789

Descriptors: (*Uranium nitrides, *Fission product release), (*Snap reactors, *Nuclear fuels), Fabrication, Porosity.

For abstract, see NSA 30 01, number 00781.

SLA-74-89 PC$5.00/MF$1.45
Sandia Labs., Albuquerque, N.Mex. (Usa).
NATURAL CONVECTION IN A SPHERICAL CAVITY WITH UNIFORM INTERNAL HEAT GENERATION.
H. C. Hardee. Apr 74, 40p
Contract AT(29-1)-789

Descriptors: (*Radioactive waste disposal, *Underground disposal), (*Cavities, *Natural convection), (*Reactor cores, *Melting).

For abstract, see NSA 30 01, number 00995.

18H. Radioactivity

AD-780 578/1GA PC$5.50/MF$1.45
Defense Civil Preparedness Agency Washington D C
RESPONSE TO DCPA QUESTIONS ON FALLOUT.
Research rept.,
Jack C. Greene. Nov 73, 50p Rept no. DCPA-RR-20

Descriptors: *Nuclear explosions, *Fallout, *Civil defense, Predictions, Radiation effects, Iodine, Reviews.

Contents: The portion of activity deposited in local fallout; Effects of small changes in burst height on the amount of local fallout; Effects of soil type and building material on the portion of radioactivity deposited in local fallout; The radioiodine problem--inhalation; Detection of fallout by the physical senses; Feasibility of developing fallout prediction techniques for operational applications; Radioactivity of craters of multimegaton explosions; Interaction of simultaneous surface bursts.

18I. Reactor Engineering and Operation

COM-74-11114/7GA PC$6.50/MF$1.45
Wisconsin Univ., Madison. Sea Grant Program.
SEDIMENTATION OFF THE KEWAUNEE NUCLEAR POWER PLANT.
Technical rept.,
John M. Pezzetta. Mar 74, 69p WIS-SG-74-221 NOAA-74051602

Descriptors: *Nuclear power plants, *Sedimentation, *Lake Michigan, Cooling water, Water pollution, Shores, Sampling, Tables(Data).
Identifiers: Sea Grant program, Two Creeks(Wisconsin), Thermal pollution.

A comparative two-year study of the nearshore sedimentary environment of Lake Michigan was undertaken to provide basic information on the physical characteristics of the lake bottom and beach zone in the vicinity of the condenser cooling water discharge flume of the Kewaunee Power Plant located near Two Creeks, Wisconsin. Wave action and wind-driven currents are the principal mechanisms by which the sediments are redistributed along the littoral zone in a general southerly direction. Monitoring of the sediment field and adjacent shoreline after the plant is in operation should indicate whether the jet flow of discharged cooling water will adversely affect the natural sedimentary processes operative in the nearshore environment. (Modified author abstract)

COO-2330-1 PC$4.00/MF$1.45
Western Interstate Nuclear Board, Lakewood, Colo. (Usa).
NUCLEAR TECHNICIAN MANPOWER IN THE WESTERN UNITED STATES.
25 Feb 74, 19p
Contract AT(11-1)-2330

Descriptors: (*Nuclear energy, *Personnel), Populations, Usa.

For abstract, see NSA 30 01, number 02219.

DUN-6181-C PC$4.50/MF$1.45
Douglas United Nuclear, Inc., Richland, Wash. (Usa).
PT-NR-125, SUPPLEMENT 6. A-B ELECTRICAL BUS HYDRAULIC INTERDEPENDENCE TEST OTP FOR AIR EXTRACTION SYSTEM (DC-3239).
R. E. Baars, and K. E. Fields. 20 Apr 73, 27p

Descriptors: (*N-reactor, *Steam condensers), Air, Electrical equipment, Extraction apparatuses, Performance testing, Turbogenerators.

For abstract, see NSA 30 01, number 02008.

DUN-6181-D PC$5.50/MF$1.45
United Nuclear Industries, Inc., Richland, Wash. (Usa).
PT-NR-125, SUPPLEMENT 6. FINAL REPORT, A-B ELECTRICAL BUS HYDRAULIC INTERDEPENDENCE TEST OTP FOR AIR EXTRACTION SYSTEM (DC-3239).
R. E. Baars, and K. E. Fields. 14 Nov 73, 47p
Contract AT(45-1)-1857

Descriptors: (*N-reactor, *Steam condensers), Efficiency, Electrical equipment, Hydraulics, Liquid flow, Performance testing, Reliability, Turbogenerators, Ventilation.

For abstract, see NSA 30 01, number 02009.

HEDL-SA-572 PC$4.00/MF$1.45
Hanford Engineering Development Lab., Richland, Wash. (Usa).
VENTED ELEMENTS.
J. A. Christensen. 30 Apr 73, 6p CONF-730652-1
Contract AT(45-1)-2170

Descriptors: (*Fftf reactor, *Control elements), Boron carbides, Performance, Specifications, Vents.

For abstract, see NSA 30 01, number 02159.

HEDL-SA-646(Rev.1) PC$4.00/MF$1.45
Hanford Engineering Development Lab., Richland, Wash. (Usa).
DYNAMICS OF MOLTEN FUEL MOTION DURING A FAST REACTOR OVERPOWER TRANSIENT.
H. J. Willenberg, W. L. Partain, and A. E. Waltar.
Apr 74, 19p CONF-740401-4
Contract AT(45-1)-2170

Descriptors: (*Lmfbr type reactors, *Meltdown), Failures, Fuel cans, Reactivity, Transients, Two-phase flow.

For abstract, see NSA 30 01, number 02068.

ORNL-TM-4580 PC$4.25/MF$1.45
Oak Ridge National Lab., Tenn. (Usa).
HIGH FLUX ISOTOPE REACTOR QUARTERLY REPORT, OCTOBER, NOVEMBER, AND DECEMBER OF 1973.
R. V. McCord, and B. L. Corbett. May 74, 22p
Contract W-7405-eng-26

Descriptors: (*Hfir reactor, *Reactor operation), Reactor maintenance, Testing.

For abstract, see NSA 30 01, number 02012.

WASH-1308 PC$5.00/MF$1.45
Usaec Directorate of Licensing, Washington, D.C.
POPULATION DISTRIBUTION AROUND NUCLEAR POWER PLANT SITES.
17 Apr 73, 39p

Descriptors: (*Nuclear power plants, *Site selection), (*Reactor sites, *Population density), Reactor safety, Regulatory guides.

For abstract, see NSA 30 01, number 02069.

18J. Reactor Materials

AAEC/E-273 PC$10.75/MF$1.45
Australian Atomic Energy Commission Research Establishment, Lucas Heights.
FLOW OF SPHERES AND NEAR SPHERES IN CYLINDRICAL VESSELS. PART IV. INDIVIDUAL FLOW PATHS IN RECIRCULATED RANDOM PACKINGS.
F. C. Gatt. Dec 73, 154p

Descriptors: (*Pebble bed reactors, Fuel spheres), (*Fuel spheres, *Flow models), Cylinders, Data, Fuel elements, Labelling, Motion, Reactor fueling, Shape, Simulation, Spheres, Zones.

For abstract, see NSA 30 01, number 02142.

AEC-tr-7538 PC$4.25/MF$1.45
Nauchno-Issledovatel'Skij Inst. Atomnykh Reaktorov, Dimitrovgrad (Ussr).
REVIEW OF BASIC RESULTS OF INVESTIGATION OF THE STATE OF STANDARD FUEL ELEMENTS OF WATER--WATER POWER REACTORS.
S. N. Votinov, V. S. Belokolytov, E. F. Davydov, A. A. Mayershin, and Z. I. Pakhomov. 24p
Translation of SRARI-P--199.

Descriptors: (*Wwer-1 reactor, Fuel elements), (*Fuel elements, *Physical radiation effects), (*Fuel cans, Physical radiation effects), (*Zirconium base alloys, Physical radiation effects), Annealing, Burnup, Failures, Hydrides, Mechanical properties, Niobium alloys.

For abstract, see NSA 30 01, number 00931.

ANL-8082 PC$4.00/MF$1.45
Argonne National Lab., Ill. (Usa).
ENTHALPY OF MOLTEN URANIUM--PLUTONIUM OXIDES.
L. Leibowitz, D. F. Fischer, and M. G. Chasanov.
Feb 74, 19p
Contract W-31-109-eng-38

Descriptors: (*Plutonium oxides, *Enthalpy), (*Uranium dioxide, Enthalpy), Calorimeters, Fusion heat, Molten salts, Specific heat, Temperature dependence, Very high temperature.

For abstract, see NSA 30 01, number 00773.

CONF-720468- PC$24.75/MF$1.45
Oak Ridge National Lab., Tenn. (Usa).
SIXTH ANNUAL INFORMATION MEETING ON HEAVY SECTION STEEL TECHNOLOGY PROGRAM, OAK RIDGE, TENNESSEE, APRIL 25--26, 1972.
1972, 452p

Descriptors: (*Water cooled reactors, Pressure vessels), (*Pressure vessels, *Steels), Leading abstract, Meetings.

For abstract, see NSA 30 01, number 00833.

GEMP-106-B PC$11.25/MF$1.45
General Electric CO., Cincinnati, Ohio (Usa). Nuclear Materials and Propulsion Operation.
HIGH-TEMPERATURE MATERIALS AND REACTOR COMPONENT DEVELOPMENT PROGRAMS. VOLUME II. MATERIALS. FIRST ANNUAL REPORT.
28 Feb 62, 184p
Contract AT(40-1)-2847

Descriptors: (*Reactor materials, *Research programs), (*Reactor components, Research programs), (*Fuel elements, Research programs), Beryllium alloys, Beryllium oxides, Boron alloys, Boron carbides, Ceramics, Electrical properties, Neutron beams, Phase diagrams, Physical radiation effects, Refractories, Shielding materials, Stability, Thermoelectric properties, Tungsten alloys, Uranium carbides, Uranium dioxide, Uranium trioxide, Yttrium oxides, Zirconium carbides, Zirconium hydrides, Zirconium oxides.

For abstract, see NSA 30 01, number 00764.

GEMP-270-B PC$13.75/MF$1.45
General Electric CO., Cincinnati, Ohio (Usa). Nuclear Materials and Propulsion Operation.
THIRD ANNUAL REPORT: HIGH-TEMPERATURE MATERIALS AND REACTOR COMPONENTS DEVELOPMENT PROGRAMS. VOLUME II. MATERIALS.
28 Feb 64, 235p
Contract AT(40-1)-2847

Descriptors: (*Reactor materials, *Research programs), (*Nuclear fuels, Research programs), (*Uranium dioxide, Nuclear fuels), (*Gas fueled reactors, Reactor materials), Beryllium oxides, Burnup, Coated fuel particles, Diffusion, Direct energy conversion, Fission products, Fuel elements, Matrix materials, Physical properties, Shielding materials, Yttrium oxides.

For abstract, see NSA 30 01, number 00765.

HW-80538 PC$4.75/MF$1.45
General Electric CO., Richland, Wash. (Usa). Hanford Atomic Products Operation.
HIGH TEMPERATURE IRRADIATIONS OF CERMET FUEL PLATES. SUMMARY REPORT, PROPOSAL C-127236.
G. R. Horn, and L. A. Pember. Jan 64, 33p
Contract AT(45-1)-1350

Descriptors: (*Fuel plates, *Physical radiation effects), (*Uranium dioxide, Physical radiation effects), (*Tungsten alloys, Physical radiation effects), Cermets, Irradiation, Losses, Very high temperature.

For abstract, see NSA 30 01, number 00776.

HW-84611 PC$7.75/MF$1.45
General Electric CO., Richland, Wash. (Usa). Hanford Atomic Products Operation.

REACTOR AND FUELS LABORATORY QUARTERLY REPORT ON CERMET RESEARCH AND DEVELOPMENT ACTIVITIES, JULY--SEPTEMBER 1964.
95p
Contract AT(45-1)-1350

Descriptors: (*Tungsten alloys, *Cermets), (*Uranium dioxide, Cermets), (*Nuclear fuels, Cermets), Density, Design, Dispersions, Fabrication, Fuel elements, Fuel plates, Irradiation, Joining, Nondestructive testing, Thermal cycling.

For abstract, see NSA 30 01, number 00766.

ICP-1028 PC$5.45/MF$1.45
Allied Chemical Corp., Idaho Falls, Idaho (Usa). Idaho Chemical Programs - Operations Office.
FIRST ELECTROLYTIC DISSOLUTION CAMPAIGN OF EBR-II FUEL AT ICPP.
W. J. Bjorklund, G. F. Offutt, and R. D. Denney. Feb 74, 64p
Contract AT(10-1)-1375

Descriptors: (*Spent fuel elements, *Head end processes), (*Uranium, *Dissolution), (*Aluminium, Dissolution), Criticality, Fuel assemblies, Fuel cans, Fuel reprocessing plants, Gadolinium, Nitric acid, Poisoning, Spent fuels.

For abstract, see NSA 30 01, number 00224.

JUL-1030-RW PC$8.50/MF$1.45
Kernforschungsanlage Juelich G.M.B.H. (F.R. Germany). Inst. Fuer Reaktorwerkstoffe.
INVESTIGATION OF FLOW MECHANISMS IN CONICAL MODELS OF FLUIDIZED BEDS AND THE TRANSFER OF THE RESULTS TO HIGH-TEMPERATURE-COATING BEDS. A STUDY ON FLUIDIZED BED COATING OF NUCLEAR FUEL KERNELS.
B. Kalthoff, E. Gyarmati, and H. Nickel. Dec 73, 108p
In German.

Descriptors: Coated fuel particles, Fluid mechanics, Fluidized bed, Surface coating.

For abstract, see NSA 30 01, number 00778.

KFK-1916 PC$5.00/MF$1.45
Kernforschungszentrum Karlsruhe (F.R. Germany). Inst. Fuer Material- und Festkoerperforschung.
TEMPERATURE DISTRIBUTION IN A NUCLEAR FUEL PIN, STRESSED BY DIFFERENT SORTS OF HEAT SOURCES.
K. Keller. Jan 74, 38p
In German.

Descriptors: (*Fuel pins, *Temperature distribution), Computer codes, Heat transfer, Mathematical models, Thermal stresses.

For abstract, see NSA 30 01, number 02143.

NAA-SR-Memo-5905 PC$3.00/MF$1.45
Atomics International Div., Canoga Park, Calif. (Usa).
BERYLLIUM OXIDE FOR MODERATOR AND FUEL APPLICATIONS.
S. C. Carniglia, J. E. Hove, and W. C. Riley. 30 Nov 60, 12p

Descriptors: (*Uranium oxides, *Beryllium oxides), Compatibility, Evaporation, Hot pressing, Mechanical properties, Oxidation, Physical properties, Stability.

For abstract, see NSA 30 01, number 00780.

NAA-SR-2541 PC$3.00/MF$1.45
Atomics International Div., Canoga Park, Calif. (Usa).
BLOW TUBE FOR THE SERVICE TESTING OF AIR-COOLED NUCLEAR REACTOR MATERIALS.
J. M. Nuding, and R. L. McKisson. 15 May 58, 19p
Contract AT(11-1)-Gen-8

Descriptors: (*Ramjet engines, *Materials testing), (*Furnaces, *Operation), Simulation.

For abstract, see NSA 30 01, number 00233.

NAA-SR-6175 PC$5.50/MF$1.45
Atomics International Div., Canoga Park, Calif. (Usa).
FABRICATION OF PLATE TYPE CORE ELEMENTS FOR THE TORY II-A REACTOR.
K. Langrod, and S. C. Carniglia. 30 Jun 61, 69p
Contract AT(11-1)-Gen-8

Descriptors: (*Tory-2a reactor, *Fuel elements), (*Beryllium oxides, *Hot pressing), Cracks, Dimensions, Fabrication, Inclusions, Inspection, Mechanical properties, Uranium dioxide.

For abstract, see NSA 30 01, number 00779.

N74-22312/4GA PC$4.50/MF$1.45
Kanner (Leo) Associates, Redwood City, Calif.
STUDIES OF HEAT RESISTANT MATERIALS FOR HIGH-TEMPERATURE GAS REACTOR.
S. Sekino. May 74, 30p NASA-TT-F-15576
Contract NASW-2481
Tran-Transl. Into English of "Koon Gasu Ro Yo Tainetsu Zairyo No Kento", Nippon Steel Corp., Tech. Res. Inst., Yawata, Japan, Report, 18 Oct. 1973 21 p.

Descriptors: *Energy policy, *Gas reactors, *Heat resistant alloys, *High temperature nuclear reactors, Corrosion resistance, Creep properties, Fatigue (Materials), Magnetohydrodynamics, Thermal stability, Weldability.

For abstract, see STAR 1213

RD/B/M-2479(Rev.) PC$5.00/MF$1.45
Central Electricity Generating Board, Berkeley (Uk). Berkeley Nuclear Labs.
THERMODYNAMIC AND TRANSPORT PROPERTIES OF LIQUID SODIUM.
M. E. Durham. Jan 74, 39p CFR/THWP/P-(72)28(Rev.)

Descriptors: (*Sodium, *Thermodynamic properties), Data compilation, Density, Enthalpy, High temperature, Liquid metals, Medium temperature, Prandtl number, Sound waves, Specific heat, Surface tension, Tables, Temperature dependence, Thermal conductivity, Thermal diffusivity, Velocity, Very high temperature, Viscosity.

For abstract, see NSA 30 01, number 00869.

74-SD-4209 PC$8.00/MF$1.45
General Electric CO., Philadelphia, PA. (Usa). Space Div.
REPORT ON THE AVAILABILITY AND COST OF CURIUM-244 FROM REACTOR FUEL REPROCESSING WASTE.
P. E. Brown, and J. A. Garate. 15 Feb 74, 99p
Contract AT(29-2)-2831

Descriptors: (*Curium 244, *Isotope production), Availability, Cost, Radioactive waste processing, Radioactive wastes, Reprocessing, Spent fuels.

For abstract, see NSA 30 01, number 00221.

18K. Reactor Physics

AAEC/E-295 PC$4.25/MF$1.45
Australian Atomic Energy Commission Research Establishment, Lucas Heights.
TIME DEPENDENT EXP 237 NP, EXP 235 U, AND EXP 239 PU FISSION RATES IN A THORIUM ASSEMBLY DURING THE INTERVAL 0 TO 200 NS USING A PULSED EXP 9 BE(D,N) SOURCE. PART II. THEORY.
S. P. Moo, M. T. Rainbow, and A. I. M. Ritchie. Feb 74, 23p

Descriptors: (*Reactor lattices, *Fission), (*Neptunium 237, Fission), (*Plutonium 239, Fission), (*Uranium 235, Fission), Buckling, Cross sections, Decay, Energy spectra, Multigroup theory, Neutron beams, Neutron flux, Neutron leakage, Neutron sources, Pulsed neutron techniques, Sensitivity, Thorium, Time dependence.

For abstract, see NSA 30 01, number 02096.

AEEW-R-915 PC$5.00/MF$1.45
Ukaea Reactor Group, Winfrith. Atomic Energy Establishment.
IMPORTANCE OF FISSION PRODUCT NUCLEAR DATA IN THE PHYSICS DESIGN OF POWER REACTOR CORES.
J. G. Tyror. Dec 73, 40p CONF-731133-4

Descriptors: (*Power reactors, *Fission products), Burnup, Fuel elements, Neutron flux, Reactivity worths, Reactor cores, Reactor kinetics.

For abstract, see NSA 30 01, number 02098.

KFK-1890 PC$4.50/MF$1.45
Kernforschungszentrum Karlsruhe (F.R. Germany). Inst. Fuer Neutronenphysik und Reaktortechnik.
CONTRIBUTION TO THE MUTUAL RESONANCE SHIELDING OF EXP 238 U AND EXP 239 PU.
I. Broeders-Siep. Feb 74, 28p
In German.

Descriptors: (*Plutonium 239, Neutron reactions), (*Uranium 238, Neutron reactions), (*Neutron reactions, *Capture), (*Lmfbr type reactors, *Reactor kinetics), Absorption, Cross sections, Doppler coefficient, Epithermal neutrons, Ev range 10-100, Ev range 100-1000, Fission, Gamma radiation, Intermediate neutrons, Nuclear temperature, Plutonium 240, Resonance, Resonance neutrons, Shielding, Uranium 239.

For abstract, see NSA 30 01, number 02099.

ORNL-TM-4437 PC$4.00/MF$1.45
Oak Ridge National Lab., Tenn. (Usa).
REACTOR CROSS-SECTION SENSITIVITY STUDIES USING TRANSPORT THEORY.
E. M. Oblow. Apr 74, 38p
Contract W-7405-eng-26

Descriptors: (*Reactor kinetics, *Cross sections), Neutron transport theory, Perturbation theory, Sensitivity.

For abstract, see NSA 30 01, number 02100.

18N. Snap Technology

AAEC/LIB/Bib-408 PC$5.00/MF$1.45
Australian Atomic Energy Commission Research Establishment, Lucas Heights.
NUCLEAR SHIPS: ECONOMIC AND SAFETY ASPECTS. A BIBLIOGRAPHY, 1961--1973.
I. M. Wybenga. Jan 74, 40p

Descriptors: (*Nuclear ships, *Bibliographies), Economics, Safety.

For abstract, see NSA 30 01, number 02014.

ARCO-3057-16 PC$5.45/MF$1.45
Arco Nuclear CO., Leechburg, PA. (Usa).
RADIOISOTOPE POWERED CARDIAC PACEMAKER PROGRAM. QUARTERLY

PROGRESS REPORT, NOVEMBER 1, 1973--JANUARY 31, 1974.
1974, 72p
Contract AT(11-1)-3057

Descriptors: (*Plutonium 238, Cardiac pacemakers), (*Cardiac pacemakers, *Research programs), Capsules, Dogs, Impact tests, Leak testing, Man, Performance testing, Production, Radioisotope batteries.

For abstract, see NSA 30 01, number 00447.

BNWL-853 PC$5.00/MF$1.45
Battelle Pacific Northwest Labs., Richland, Wash. (Usa).
FUELED GRAPHITE STUDIES. QUARTERLY PROGRESS REPORT, APRIL--JUNE 1968.
Aug 68, 40p
Contract AT(45-1)-1830

Descriptors: (*Graphite, *Nuclear fuels), (*Fuel elements, *Corrosion), (*Rover reactors, Fuel elements), Hydrogen, Niobium carbides, Porosity.

For abstract, see NSA 30 01, number 02016.

CNLM-4255 PC$4.00/MF$1.45
Pratt and Whitney Aircraft, Middletown, Conn. (Usa). Connecticut Advanced Nuclear Engineering Lab.
SNAP-50 SPACE POWERPLANT.
17 Sep 62, 17p
Contract AT(30-1)-2789

Descriptors: (*Snap 50 reactor, *Reactor components), Reactor kinetics, Reactor materials, Research programs, Specifications, Testing.

For abstract, see NSA 30 01, number 02017.

GEMP-600(Vol.3) PC$10.50/MF$1.45
General Electric CO., Cincinnati, Ohio (Usa). Nuclear Materials and Propulsion Operation.
710 HIGH-TEMPERATURE GAS REACTOR PROGRAM SUMMARY REPORT. VOLUME III. FUEL ELEMENT DEVELOPMENT.
1967, 149p
Contract AT(40-1)-2847

Descriptors: (*710 reactor, *Fuel elements), (*Uranium dioxide, *Cermets), Research programs, Space power reactors, Testing, Tungsten alloys.

For abstract, see NSA 30 01, number 02018.

HW-83980 PC$5.50/MF$1.45
General Electric CO., Richland, Wash. (Usa). Hanford Atomic Products Operation.
FUELED GRAPHITE STUDIES PROGRESS REPORT, APRIL--JUNE 1964.
1964, 46p
Contract AT(45-1)-1350

Descriptors: (*Rover reactors, *Nuclear fuels), Adhesion, Coated fuel particles, Coatings, Diffusion, Graphite, Joining, Niobium carbides, Pyrolytic carbon.

For abstract, see NSA 30 01, number 02019.

MLM-CF-69-6-161 PC$4.75/MF$1.45
Mound Lab., Miamisburg, Ohio (Usa).
DART II SUMMARY REPORT.
E. W. Johnson, and K. D. Phipps. 19 Sep 69, 34p
Contract AT-33-1-Gen-53

Descriptors: (*Plutonium 238, *Radioisotope heat sources), (*Thrusters, *Performance testing), (*Space vehicles, Thrusters), Ammonia, Decomposition, Plutonium oxides, Propulsion.

For abstract, see NSA 30 01, number 00449.

MLM-2134 PC$4.00/MF$1.45
Mound Lab., Miamisburg, Ohio (Usa).
ADVANCED HEAT SOURCE CONCEPTS.
J. E. Selle. 10 Apr 74, 8p
Contract AT-33-1-GEN-53

Descriptors: (*Radioisotope heat sources, *Design), Capsules, Electric power, Plutonium 238, Radioisotope batteries, Space vehicles.

For abstract, see NSA 30 01, number 00448.

MND-3062-27 PC$8.25/MF$1.45
Martin Marietta Corp., Baltimore, MD. (Usa).
COMPATIBILITY OF STRONTIUM SPACE FUEL FORMS.
F. J. Jr. Miraglia. Jun 66, 105p
Contract AT(30-1)-3062

Descriptors: (*Radioisotope heat sources, *Capsules), (*Haynes 25 alloy, *Compatibility), (*Molybdenum, Compatibility), (*Hastelloys, Compatibility), Performance testing, Snap batteries, Space vehicles, Stainless steel-321, Strontium, Strontium fluorides, Strontium 90, Tantalum, Zirconium fluorides, Zirconium oxides.

For abstract, see NSA 30 01, number 00450.

NAA-SR-Memo-10579 PC$28.75/MF$1.45
Atomics International Div., Canoga Park, Calif. (Usa).
SNAP SYSTEMS CAPABILITIES.
19 Oct 64, 535p

Descriptors: (*Snap 10 reactor, *Specifications), (*Snap 8 reactor, Specifications), (*Snap reactors, Specifications), Performance, Shielding, Thermodynamic cycles.

For abstract, see NSA 30 01, number 02020.

TID-24818 PC$21.50/MF$1.45
Army Natick Labs., Mass. (Usa).
PROCEEDINGS OF THE THERMIONIC CONVERSION SPECIALIST CONFERENCE, NATICK, MASSACHUSETTS, OCTOBER 23-24, 1968.
Apr 69, 388p CONF-681059-

Descriptors: (*Thermionic reactors, *Performance), (*Radioisotope heat sources, Performance), Leading abstract, Specifications.

For abstract, see NSA 30 01, number 02021.

TIM-698 PC$4.25/MF$1.45
Pratt and Whitney Aircraft, Middletown, Conn. (Usa). Connecticut Advanced Nuclear Engineering Lab.
URANIUM MONONITRIDE--NIOBIUM CERMET FUEL: STATUS REPORT.
A. D. Miller, and R. A. Craig. 27 Jul 61, 24p
Contract AT(30-1)-2789

Descriptors: (*Uranium nitrides, *Cermets), (*Niobium alloys, Cermets), (*Aircraft propulsion reactors, *Dispersion nuclear fuels), Compatibility, Fabrication, Fission product release, Lithium, Lithium cooled reactors, Physical radiation effects, Stability.

For abstract, see NSA 30 01, number 02050.

UCRL-6941 PC$18.00/MF$1.45
California Univ., Livermore (Usa). Lawrence Livermore Lab.
PLUTO PROGRAM. MEETING OF THE JOINT ARS/ANS/IAS NUCLEAR PROPULSION CONFERENCE, MONTEREY, AUGUST 15--17, 1962.
8 Jun 62, 318p CONF-620805-
Contract W-7405-eng-48

Descriptors: (*Tory-2a reactor, *Research programs), (*Tory-2c reactor, Research programs), Beryllium oxides, Ceramics, Design, Reactor materials, Testing.

For abstract, see NSA 30 01, number 02051.

Y-EB-36 PC$5.25/MF$1.45
Oak Ridge Y-12 Plant, Tenn. (Usa).
PHOEBUS 1B STUDIES INTERIM REPORT.
A. K. Van Hull, and R. D. Smith. 6 Sep 67, 44p
Contract W-7405-eng-26

Descriptors: (*Phoebus-1b reactor, *Fuel elements), Extrusion, Fabrication, Performance, Surface coating, Weight.

For abstract, see NSA 30 01, number 02052.

Y-EB-37 PC$5.25/MF$1.45
Oak Ridge Y-12 Plant, Tenn. (Usa).
NRX-A6R PREDICTION REPORT.
A. K. Van Hull, and R. D. Smith. 27 Oct 67, 44p
Contract W-7405-eng-26

Descriptors: (*Nrx-a6 reactor, *Fuel elements), Performance, Reactor operation, Surface coating, Weight.

For abstract, see NSA 30 01, number 02053.

19. ORDNANCE

19A. Ammunition, Explosives, and Pyrotechnics

AD-780 673/0GA PC$6.75/MF$1.45
Army Materiel Command Alexandria Va
ENGINEERING DESIGN HANDBOOK - MILITARY PYROTECHNICS SERIES. PART FOUR. DESIGN OF AMMUNITION FOR PYROTECHNIC EFFECTS.
15 Mar 74, 289p Rept no. AMCP-706-188
See also Part 3, AD-830 394.

Descriptors: *Pyrotechnics, *Handbooks, Luminosity, Smoke munitions, Ballistics, Deceleration, Parachutes, Ignition, Human factors engineering.
Identifiers: *Engineering design handbooks, *Design standards.

The handbook embraces the areas to be considered in the design of pyrotechnic ammunition with emphasis on the engineering aspects of the terminal effects. Associated topics to be considered during the design--such as light, sound, heat, ignition, and ballistic considerations--are covered briefly. Consideration is given not only to design with respect to performance but also to producibility, reliability, maintainability, cost, safety, and human factors.

AD-915 482/4 PC$8.75/MF$1.45
General American Transportation Corp., Niles, Ill. General American Research Div.
EFFECT OF EARTH COVER ON FAR-FIELD FRAGMENT DISTRIBUTION.
Final Rept. 9 Jan-9 Jul 73, Leif E. Fugelso, and Carl E. Rathmann. Dec. 73, 112 p.
Contract DAAB09-73-C-0010

Descriptors: *Ammunition damage, Accidents, *Ammunition fragments, Hazards, Mathematical models, High explosive ammunition, Storage, Revetments, Soils, Coverings, Safety, Numerical analysis, Ballistics, Far-field, Density, Range (Distance), Bombs, Projectiles, Mass, Packaging density, Equations of motion, Impact, Velocity, Distribution, Approximation(Mathematics), Collisions, Interactions.
Identifiers: Storage Igloos.

The effect of earth cover on the far-field fragment density expected from the accidental detonation of stored munitions was estimated by preparing three models of fragment-cover interaction. Comparisons of the theoretical calculations with limited experimental data show that the model

wherein the crown of the earth cover does not retard any fragments gives the best agreement. Models for fragment-fragment interaction which effectively account for stack configuration lead to a simplified model for the effective number of munitions contributing to the far-field fragment density. An approximation technique for the rapid calculation of the far-filed fragment density was prepared to assist in the ready evaluation of any model.

MHSMB-37 PC$4.25/MF$1.45
Mason and Hanger-Silas Mason CO., Inc., Burlington, Iowa (Usa). Development Dept.
RECOVERY OF HMX FROM SCRAP PBX-9404 HIGH EXPLOSIVE. TECHNICAL REPORT NO. 219.
E. E. Leake. 26 Oct 73, 44p
Contract W-49-010-AMC-68(A)

Descriptors: (*Chemical explosives, *Fabrication), Control, Economics, Production, Reprocessing.

For abstract, see NSA 30 01, number 02336.

MHSMP-73-29 PC$4.75/MF$1.45
Mason and Hanger-Silas Mason CO., Inc., Amarillo, Tex. (Usa).
DISPOSAL OF WASTE OR EXCESS HIGH EXPLOSIVES. PROGRESS REPORT, APRIL--JUNE 1973.
F. I. Honea, W. A. Bullerdiek, J. E. Wichmann, and T. K. Mehrhoff. 1973, 32p
Contract DA-11-173-AMC-487(A)

Descriptors: (*Incinerators, *Design), (*Chemical explosives, *Waste disposal), Air pollution, Biochemistry, Combustion, Economics, Environment, Legal aspects, Residues, Wastes.

For abstract, see NSA 30 01, number 02282.

MHSMP-73-40 PC$4.00/MF$1.45
Mason and Hanger-Silas Mason CO., Inc., Amarillo, Tex. (Usa).
DISPOSAL OF WASTE OR EXCESS HIGH EXPLOSIVES. PROGRESS REPORT, JULY--SEPTEMBER 1973.
F. I. Honea, and W. A. Bullerdiek. 1973, 20p
Contract DA-11-173-AMC-487(A)

Descriptors: (*Incinerators, *Design), (*Chemical explosives, *Waste disposal), Air pollution, Biochemistry, Combustion, Economics, Environment, Legal aspects, Wastes.

For abstract, see NSA 30 01, number 02283.

MHSMP-74-1 PC$10.50/MF$1.45
Mason and Hanger-Silas Mason CO., Inc., Amarillo, Tex. (Usa).
MECHANICAL AND FRICTIONAL BEHAVIOR OF SEVERAL HMX/ESTANE BASED EXPLOSIVES.
J. H. Van Velkinburgh. Jan 74, 150p
Contract DA-11-173-AMC-487(A)

Descriptors: (*Chemical explosives, *Mechanical properties), Accelerometers, Chemical explosions, Compression, Creep, Friction, Height, Impact shock, Organic nitrogen compounds, Performance testing, Tensile properties.

For abstract, see NSA 30 01, number 02399.

MHSMP-74-2 PC$6.50/MF$1.45
Mason and Hanger-Silas Mason CO., Inc., Amarillo, Tex. (Usa).
DISPOSAL OF WASTE OR EXCESS HIGH EXPLOSIVES. PROGRESS REPORT, OCTOBER--DECEMBER 1973.
F. I. Honea, and T. K. Mehrhoff. 1973, 67p
Contract DA-11-173-AMC-487(A)

Descriptors: (*Incinerators, *Design), (*Chemical explosions, *Waste disposal), Air pollution, Biochemistry, Combustion, Economics, Environment, Legal aspects, Wastes.

For abstract, see NSA 30 01, number 02284.

MHSMP-74-5-A PC$4.00/MF$1.45
Mason and Hanger-Silas Mason CO., Inc., Amarillo, Tex. (Usa).
STUDY OF FERRIC ACETYLACETONATE AND OTHER CATALYSTS IN THE CURING AGENT FOR ADIPRENE L-315.
P. Foster. Dec 73, 8p
Contract DA-11-173-AMC-487(A)

Descriptors: (*Chemical explosives, *Catalysts), Chemical reactions, Compatibility, Organic compounds, Precipitation, Water.

For abstract, see NSA 30 01, number 02337.

MHSMP-74-5-C PC$4.00/MF$1.45
Mason and Hanger-Silas Mason CO., Inc., Amarillo, Tex. (Usa).
SLOW PBX AND PLANE WAVE LENS DEVELOPMENT.
J. A. Crutchmer, and C. E. Canada. Dec 73, 18p
Contract DA-11-173-AMC-487(A)

Descriptors: (*Chemical explosives, *Fabrication), Impact shock, Interactions, Lenses, Pressing, Shock waves, Velocity, Wave propagation.

For abstract, see NSA 30 01, number 02338.

MHSMP-74-5-D PC$4.00/MF$1.45
Mason and Hanger-Silas Mason CO., Inc., Amarillo, Tex. (Usa).
DRIVER ASSEMBLIES RDX/SYLGARD INVESTIGATION.
B. D. Faubion. Dec 73, 6p
Contract DA-11-173-AMC-487(A)

Descriptors: Aging, Chemical analysis, Chemical composition, Chemical explosives, Compatibility, Crystals, Grain growth.

For abstract, see NSA 30 01, number 02339.

MHSMP-74-5-E PC$4.00/MF$1.45
Mason and Hanger-Silas Mason CO., Inc., Amarillo, Tex. (Usa).
PETN AND LX-13 PROCESSING.
A. G. Osborn, T. L. Stallings, J. G. Locke, and A. A. Duncan. Dec 73, 6p
Contract DA-11-173-AMC-487(A)

Descriptors: (*Chemical explosives, *Milling), Extrusion, Lawrence livermore laboratory, Petn, Sample preparation.

For abstract, see NSA 30 01, number 02340.

MHSMP-74-5-F PC$4.00/MF$1.45
Mason and Hanger-Silas Mason CO., Inc., Amarillo, Tex. (Usa).
RDX/SYLGARD.
R. J. Slape. Dec 73, 16p
Contract DA-11-173-AMC-487(A)

Descriptors: (*Chemical explosives, *Purification), Crystallization, Extrusion, Fabrication, Physical properties, Precipitation, Tetryl, Variations.

For abstract, see NSA 30 01, number 02341.

MHSMP-74-5-G PC$4.00/MF$1.45
Mason and Hanger-Silas Mason CO., Inc., Amarillo, Tex. (Usa).
PASTE PROCESSING.
A. G. Osborn, T. L. Stallings, and R. J. Slape. Dec 73, 4p
Contract DA-11-173-AMC-487(A)

Descriptors: (*Chemical explosives, *Fabrication), Performance testing.

For abstract, see NSA 30 01, number 02342.

MHSMP-74-5-H PC$4.50/MF$1.45
Mason and Hanger-Silas Mason CO., Inc., Amarillo, Tex. (Usa).
PETN RECRYSTALLIZATION STUDY.
P. A. Foster. Dec 73, 28p
Contract DA-11-173-AMC-487(A)

Descriptors: (*Petn, *Recrystallization), Impurities, Particle size, Variations.

For abstract, see NSA 30 01, number 02343.

MHSMP-74-5-I PC$4.00/MF$1.45
Mason and Hanger-Silas Mason CO., Inc., Amarillo, Tex. (Usa).
HE PRESSING.
J. D. Harrell. Dec 73, 3p
Contract DA-11-173-AMC-487(A)

Descriptors: (*Chemical explosives, *Pressing), Compacting, Density, High pressure.

For abstract, see NSA 30 01, number 02344.

MHSMP-74-5-J PC$4.00/MF$1.45
Mason and Hanger-Silas Mason CO., Inc., Amarillo, Tex. (Usa).
LX-13 COMPONENT SEPARATION IN SILK SCREEN EXTRUSION.
G. L. Clink. Dec 73, 5p
Contract DA-11-173-AMC-487(A)

Descriptors: Chemical explosives, Extrusion, Fibers, High pressure, Lawrence livermore laboratory, Medium pressure, Nuclear magnetic resonance, Separation processes, Variations.

For abstract, see NSA 30 01, number 02345.

MHSMP-74-5-K PC$4.00/MF$1.45
Mason and Hanger-Silas Mason CO., Inc., Amarillo, Tex. (Usa).
NMR ANALYSIS OF RX-08-DR (PEX).
G. L. Clink. Dec 73, 4p
Contract DA-11-173-AMC-487(A)

Descriptors: (*Chemical explosives, *Spectroscopy), Acetone, Dissolution, Economics, Nuclear magnetic resonance, Petn.

For abstract, see NSA 30 01, number 02346.

MHSMP-74-5-L PC$4.00/MF$1.45
Mason and Hanger-Silas Mason CO., Inc., Amarillo, Tex. (Usa).
X-RAY DIFFRACTION STUDIES.
C. C. Blair. Dec 73, 5p
Contract DA-11-173-AMC-487(A)

Descriptors: (*Chemical explosives, *X-ray diffraction), Interactions, Mixtures.

For abstract, see NSA 30 01, number 02347.

MHSMP-74-5-M PC$4.00/MF$1.45
Mason and Hanger-Silas Mason CO., Inc., Amarillo, Tex. (Usa).
HIGH PURITY PETN AND TRACE IMPURITY ANALYSIS.
J. Sandoval. Dec 73, 3p
Contract DA-11-173-AMC-487(A)

Descriptors: (*Petn, *Chemical composition), Chromatography, Crystallization, Impurities, Purification.

For abstract, see NSA 30 01, number 02348.

MHSMP-74-5-N PC$4.00/MF$1.45
Mason and Hanger-Silas Mason CO., Inc., Amarillo, Tex. (Usa).
PARTICLE CHARACTERIZATION.
A. A. Duncan. Dec 73, 8p
Contract DA-11-173-AMC-487(A)

Descriptors: (*Chemical explosives, *Milling), Extrusion, Particle size, Petn, Shape.

For abstract, see NSA 30 01, number 02349.

MHSMP-74-5-O PC$4.00/MF$1.45
Mason and Hanger-Silas Mason CO., Inc., Amarillo, Tex. (Usa).
HE PARTICLE CHARACTERIZATION FOR QUALITY CONTROL.
R. C. Giberson. Dec 73, 8p
Contract DA-11-173-AMC-487(A)

Descriptors: (*Chemical explosives, *Particle size), Milling, Petn, Physical properties, Quality control.

For abstract, see NSA 30 01, number 02350.

MHSMP-74-5-P PC$4.00/MF$1.45
Mason and Hanger-Silas Mason CO., Inc., Amarillo, Tex. (Usa).
DEVELOP AND IMPLEMENT METHODS FOR DESTRUCTIVE TESTS.
P. E. Kramer. Dec 73, 5p
Contract DA-11-173-AMC-487(A)

Descriptors: (*Chemical explosives, *Destructive testing), Compatibility, Data acquisition, Impact shock.

For abstract, see NSA 30 01, number 02351.

MHSMP-74-5-Q PC$4.00/MF$1.45
Mason and Hanger-Silas Mason CO., Inc., Amarillo, Tex. (Usa).
MATHEMATICAL ANALYSIS OF HE DATA.
R. W. Ashcraft. Dec 73, 5p
Contract DA-11-173-AMC-487(A)

Descriptors: (*Petn, *Recrystallization), Chemical explosives, Computer codes, Mathematical models, Simulation, T codes.

For abstract, see NSA 30 01, number 02352.

MHSMP-74-6-A PC$4.00/MF$1.45
Mason and Hanger-Silas Mason CO., Inc., Amarillo, Tex. (Usa).
PBX PROCESSING.
A. G. Osborn, and T. L. Stallings. Dec 73, 5p
Contract DA-11-173-AMC-487(A)

Descriptors: (*Chemical explosions, *Sample preparation), Lawrence livermore laboratory, Performance testing.

For abstract, see NSA 30 01, number 02353.

MHSMP-74-6-B PC$4.00/MF$1.45
Mason and Hanger-Silas Mason CO., Inc., Amarillo, Tex. (Usa).
EXPLOSIVES PERFORMANCE AND SENSITIVITY.
P. A. Kramer. Dec 73, 3p
Contract DA-11-173-AMC-487(A)

Descriptors: (*Chemical explosives, *Performance testing), Comparative evaluations, Errors, Expansion, Sample preparation, Sensitivity, Velocity.

For abstract, see NSA 30 01, number 02354.

MHSMP-74-6-C PC$4.75/MF$1.45
Mason and Hanger-Silas Mason CO., Inc., Amarillo, Tex. (Usa).
HE FRICTION SENSITIVITY.
J. H. Van Velkinburgh. Dec 73, 35p
Contract DA-11-173-AMC-487(A)

Descriptors: (*Chemical explosives, *Sliding friction), Height, Impact tests, Lawrence livermore laboratory, Melting, Performance testing, Rotation, Sensitivity, Velocity.

For abstract, see NSA 30 01, number 02355.

MHSMP-74-6-D PC$5.00/MF$1.45
Mason and Hanger-Silas Mason CO., Inc., Amarillo, Tex. (Usa).
THERMAL PROPERTIES, REACTIVITY AND COMPATIBILITY.
L. C. Myers. Dec 73, 38p
Contract DA-11-173-AMC-487(A)

Descriptors: Chemical explosives, Compatibility, Decomposition, Lawrence livermore laboratory, Medium temperature, Petn, Reactivity, Thermodynamic properties.

For abstract, see NSA 30 01, number 02356.

MHSMP-74-6-E PC$4.50/MF$1.45
Mason and Hanger-Silas Mason CO., Inc., Amarillo, Tex. (Usa).
MECHANICAL PROPERTIES OF EXPLOSIVES.
H. D. Johnson. Dec 73, 29p
Contract DA-11-173-AMC-487(A)

Descriptors: (*Chemical explosives, *Mechanical properties), Creep, Density, Failures, Lawrence livermore laboratory, Performance testing.

For abstract, see NSA 30 01, number 02357.

MHSMP-74-7 PC$4.00/MF$1.45
Mason and Hanger-Silas Mason CO., Inc., Amarillo, Tex. (Usa).
DETONATION VELOCITY AND PRESSURE OF 1/2-INCH DIAMETER HNAB PELLETS.
T. W. Warren. Dec 73, 7p
Contract DA-11-173-AMC-487(A)

Descriptors: (*Chemical explosives, *Performance testing), Impact shock, Pressing, Sample preparation, Tetryl, Velocity.

For abstract, see NSA 30 01, number 02358.

MHSMP-74-8 PC$4.00/MF$1.45
Mason and Hanger-Silas Mason CO., Inc., Amarillo, Tex. (Usa).
ANALYSIS OF S-TRICHLOROTRINITROBENZENE AND 1,3,5-TRINITRO-1,3,5-TRIAZACYCLOHEXANE SAMPLES BY LIQUID CHROMATOGRAPHY.
W. T. Quinlin. Dec 73, 10p
Contract DA-11-173-AMC-487(A)

Descriptors: (*Chemical explosives, *Chemical analysis), Chromatography, Cyclohexane, Impurities, Nitrobenzene, Synthesis.

For abstract, see NSA 30 01, number 02359.

19C. Combat Vehicles

AD-780 695/3GA PC$3.00/MF$1.45
Cold Regions Research and Engineering Lab Hanover N H
COBRA: POSITIVE PITCH CONTROLLED ARTICULATED TESTBED.
Special rept.,
Ben Hanamoto. May 74, 15p Rept no. CRREL-SR-207

Descriptors: *Tracked vehicles, Mobility, Offroad traffic, Pitch(Inclination), Control systems, Field tests, Drives.
Identifiers: Cobra vehicle, Articulated vehicles.

The objective of the test program was to compare the performance of the multiunit articulated tracked vehicle Cobra with the positive pitch control between units operated in the locked and unlocked modes. Two vehicle performance characteristics were investigated: drawbar pull-slip and slope climbing.

AD-780 918/9GA PC$3.25/MF$1.45
Iowa Univ Iowa City Dept of Mechanics and Hydraulics
DYNAMIC ANALYSIS AND OPTIMAL DESIGN FORMULATION OF A WEAPON-VEHICLE SYSTEM,
B. M. Kwak, K. Rim, and J. S. Arora. Apr 74, 42p Rept no. THEMIS-UI-50
Contract DAAF03-69-C-0014
Report on Vibration and Stability of Military and Other Complex Vehicular Systems.

Descriptors: *Combat vehicles, *Gun mounts, *Guns, Interactions, Dynamic response, Kinematics, Kinetic energy, Equations of motion, Optimization.
Identifiers: Themis project.

A dynamic model of an automatic weapon-vehicle system is analyzed and formulated as an optimal design problem. The design concept adopted is to find the design parameters such that the gun barrel has a desirable property of least possible disturbance from a perturbation due to continuous bursts under uncertainty of environments such as road conditions and the azimuth angle. Thus, the optimal design problem becomes a 'parametric optimal design' problem with a system of highly nonlinear differential equations that describe the state of the system. A numerically implementable transcription is given such that the formulation fits into the finite dimensional parametric optimal design problem. (Author)

AD-780 921/3GA PC$3.75/MF$1.45
Iowa Univ Iowa City Dept of Mechanics and Hydraulics
WEAPON-VEHICLE MODELING AND SOLUTION,
P. F. Sun, S. J. Chen, D. T. Davy, and W. F. Ames. 20 Jan 74, 58p Rept no. THEMIS-UI-49
Contract DAAF03-69-C-0014
Report on Vibration and Stability of Military and Other Complex Vehicular Systems.

Descriptors: *Combat vehicles, *Gun mounts, *Guns, Interactions, Dynamic response, Kinematics, Kinetic energy, Mathematical models, Computer programs, Equations of motion, Numerical integration.
Identifiers: Themis project.

A mathematical model is constructed for a personel vehicle carrying a light weapon. The equations of motion are generated and solved during simultaneous vehicle motion and firing. (Author)

19D. Explosions, Ballistics, and Armor

AD-780 624/3GA PC$6.00/MF$1.45
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Engineering
ISO-DAMAGE CURVES FOR PLATES UNDER BLAST LOADING.
Master's thesis,
Philip B. Aitken-Cade. Mar 74, 57p Rept no. FAW/MC/74-1

Descriptors: *Metal plates, *Blast loads, Deflection, Bending stress, Shear stresses, Theses.

The report presents a development of iso-damage curves for a fixed edge square membrane, a simply supported circular plate, a clamped circular plate, a simply supported square plate, and a clamped square plate. The blast loading of the membrane is idealized two ways; first as a rectangular pressure

pulse and secondly as an exponentially decaying pressure pulse. The blast loading on the plates is idealized as a rectangular pressure pulse. The membrane is assumed to behave like rigid-plastic material that will not deform until the yield stress is reached. Expressions are obtained for the final deflection of the membrane and by the judicious choice of dimensionless variables, a single isodamage curve is developed. (Modified author abstract)

AD-780 629/2GA PC$7.00/MF$1.45
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Engineering
SYNERGISTIC DAMAGE CAUSED BY MULTIPLE FRAGMENT IMPACT ON CLOSED SYSTEMS.
Master's thesis,
Russell T. Boice, Jr. Mar 74, 76p Rept no. GAW/MC/74-10

Descriptors: *Projectiles, *Terminal ballistics, Synergism, Hypersonic characteristics, Aluminum, Impact, Fragments, Penetration, Theses.
Identifiers: *Synergistic damage.

The purpose of this study was to hypothesize the most probable cause for synergistic damage effects sometimes observed when multiple aluminum fragments impact an aluminum box structure. The synergistic damage is characterized by an unexpected increase of pressure within the box causing notable bulging. There are reports of a sudden pressure increase at approximately 8000 ft/sec. The study was conducted through literature search and simple engineering approximations. (Modified author abstract)

AD-780 707/6GA PC$3.75/MF$1.45
Army Engineer Waterways Experiment Station Livermore Calif Explosive Excavation Research Lab
AN INVESTIGATION OF A CONCEPT OF LIMITING THE EFFECTS OF CRATERING DETONATIONS,
Bruce B. Redpath. Mar 74, 68p Rept no. EERL-MP-E-74-3

Descriptors: *Detonations, *Cratering, Explosion effects, Explosive charges, Rock, Underground explosions, Test methods.
Identifiers: *Blasting, Lost Creek project.

Experiments were conducted to investigate a concept of limiting some adverse effects of using explosives to break rock. Specifically, it was hypothesized that a planar zone of explosively fractured rock might attenuate the stress wave generated by an explosive charge, and thereby serve to protect a structural plane, such as a presplit surface, from damage. The zone of explosively fractured rock has been designated a buffer zone. The overall concept would be to place buffer zones between structural rock surfaces and the main excavation charges. Peak particle velocities generated by 200-lb, deeply buried cratering charges were measured both with and without the presence of intervening buffer zones. The results were not conclusive as to the effectiveness of buffer zones, and improved experimental procedures may be required in further investigations. (Modified author abstract)

AD-780 825/6GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
SOME PROPERTIES OF THE PROPAGATION OF CYLINDRICAL EXPLOSION WAVES UNDERGROUND,
O. O. Vovk, A. G. Smirnov, and A. O. Kuzmenko. 7 Jun 74, 11p Rept no. FTD-HC-23-1816-74
Edited trans. of Akademiya Nauk URSR, Kiev. Dopovidi. Seriya A: Fiziko-Tekhnichni ta Matematichni Nauki, n3 p270-274 1973.

Descriptors: *Underground explosions, *Ground motion, Explosion bubbles, Seismic waves, Soils, Detonation waves, Translations, USSR.

The authors conducted a series of experiments at the explosion-experimental facility of the Academy of Sciences, Ukrainian SSR to determine the property of soil mobility at the center area and to study the characteristic peculiarities in the change of oscillation parameters of soil particles with the increase of depth and increase in the distance from the axis of a cylindrical vertical charge.

LA-UR-73-1297 PC$4.00/MF$1.45
Los Alamos Scientific Lab., N.Mex. (Usa).
SITUATION IN WHICH THE ESTIMATION OF THE "INTERACTION VARIANCE" IS THE PURPOSE OF AN EXPERIMENT.
R. H. Moore, G. L. Tietjen, and J. B. Ramsey. 1973, 9p CONF-740506-1
Contract W-7405-eng-36

Descriptors: Exploding wires, Interactions.

For abstract, see NSA 30 01, number 02266.

NVO-474-2 PC$4.00/MF$1.45
Geological Survey, Las Vegas, Nev. (Usa).
STRUCTURAL AND FREE FIELD SEISMIC MEASUREMENTS OF THE ZONIA MINE BLAST, ARIZONA.
R. Navarro. Feb 74, 45p
Contract AT(29-2)-474

Descriptors: Ammonium compounds, Arizona, Chemical explosives, Detonations, Explosions, Ground motion, Mining, Nitrates, Seismic detection, Seismographs.

For abstract, see NSA 30 01, number 02401.

N74-22570/7GA PC$8.00/MF$1.45
Michigan Univ., Ann Arbor. Gas Dynamics Labs.
TWO PHASE DETONATION STUDIES.
Final Report, 1 Feb. 1973 - 1 Feb. 1974.
J. A. Nicholls, T. H. Pierce, H. Miyajima, R. Oza, and P. Patil. May 74, 98p NASA-CR-134623, UM-026030-5-F
Contract NGL-23-005-336

Descriptors: *Detonation, *Firing (Igniting), *Photointerpretation, *Shock waves, Bibliographies, Flame propagation, Liquid oxidizers, Particle size distribution.

For abstract, see STAR 1213

PAT-APPL-412 854 PC$4.00/MF$1.45
Department of the Air Force Washington D C
PERSONNEL ARMOR SUSPENSION SYSTEM.
Patent Application,
D. A. George. Filed 5 Nov 73, 10p Rept no.
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Body armor, Patents, Protective clothing, Aviation personnel, Human factors engineering.
Identifiers: PAT-CL-2-2-5, *Patent applications.

The patent application relates to a personnel armor suspension system having a conventional survival vest modified to support the body armor. The front armor members have a pair of zipper elements secured to the armor carrier with one zipper element and slider on the armor engaging one of the zipper elements on the survival vest and the other zipper member on the armor engaging the slider and the other zipper element on the survival vest. The back armor member fits into a pocket on the back of the survival vest and has a slider and zipper element which engages a zipper element near the neck portion of the survival vest. A Velcro loop patch on the survival vest can be used to engage a Velcro hook patch on the fragmentation armor member to add to the support for the back member.

SLA-73-1034 PC$4.50/MF$1.45
Sandia Labs., Albuquerque, N.Mex. (Usa).
METHODOLOGY FOR COMPUTATION OF INTERFACE PARAMETERS OF A HOT-WIRE EXPLOSIVE DEVICE FROM THE ELECTROTHERMAL RESPONSE ANALOG.
A. C. Strasburg. Apr 74, 29p
Contract AT(29-1)-789

Descriptors: Data processing, Electric conductivity, Electric potential, Exploding wires, Pulses, Thermodynamics.

For abstract, see NSA 30 01, number 02407.

SLA-73-1065 PC$4.00/MF$1.45
Sandia Labs., Albuquerque, N.Mex. (Usa).
EFFECTS OF FUEL FIRES ON CONTAINED EXPLOSIVES CHARGES.
D. O. Lee, A. B. Donaldson, and H. M. Jones. Apr 74, 14p
Contract AT(29-1)-789

Descriptors: Chemical explosives, Combustion, Containers, Decomposition, Detonations, Detonators, Fires, Hazards, Heating, Kerosene, Mechanical structures, Organic nitrogen compounds.

For abstract, see NSA 30 01, number 02408.

SLA-73-1069 PC$4.00/MF$1.45
Sandia Labs., Albuquerque, N.Mex. (Usa).
RESPONSE OF CARBON--CARBON RINGS TO AN AXISYMMETRIC IMPULSE: A MATERIAL INVESTIGATION.
H. C. Walling, and J. T. Schamaun. Dec 73, 13p
Contract AT(29-1)-789

Descriptors: (*Rings, *Strains), Shock waves, Strain gages, Stresses.

For abstract, see NSA 30 01, number 02409.

SLA-74-33 PC$3.25/MF$1.45
Sandia Labs., Albuquerque, N.Mex. (Usa).
BLAST PREDICTIONS AND MICROBAROGRAPH MEASUREMENTS FOR TOOELE ARMY DEPOT TEST, FINAL REPORT.
J. W. Reed. Feb 74, 25p
Contract AT(29-1)-789

Descriptors: Chemical explosions, Disturbances, Meteorology, Noise, Safety, Shock waves.

For abstract, see NSA 30 01, number 02416.

SLA-74-5065 PC$4.50/MF$1.45
Sandia Labs., Albuquerque, N.Mex. (Usa).
COMPUTER GENERATED VISUAL DOCUMENTATION OF THEORETICAL STORE SEPARATION ANALYSES.
H. R. Spahr. 1974, 26p CONF-740512-5

Descriptors: (*Trajectories, Computer codes), (*Computer codes, *M codes), Aircraft, Cdc computers, Motion, Optical systems, Real time systems.

For abstract, see NSA 30 01, number 02252.

SLA-74-5094 PC$3.00/MF$1.45
Sandia Labs., Albuquerque, N.Mex. (Usa).
THERMAL IGNITION OF PYROTECHNICS THROUGH A BULKHEAD.
E. A. Kjeldgaard, and D. J. Gould. 14p

Descriptors: Combustion, Design, Heating, Pyrotechnic devices, Specific heat, Stainless steels, Thermal conductivity.

For abstract, see NSA 30 01, number 02372.

UCID-16469 PC$4.00/MF$1.45
California Univ., Livermore (Usa). Lawrence Livermore Lab.

CRITICAL ENERGY FOR SHOCK INITIATION OF TETRYL AND A-5.
L. G. Green, E. J. Jr. Nidick, and F. E. Walker. 14 Mar 74, 13p
Contract W-7405-eng-48

Descriptors: (*Chemical explosives, *Energy), Density, Sensitivity, Shock waves.

For abstract, see NSA 30 01, number 02375.

19E. Fire Control and Bombing Systems

AD-780 937/9GA PC$4.00/MF$1.45
International Laser Systems Inc Orlando Fla
CUEING DESIGNATOR.
Technical rept. Dec 73-May 74,
R. J. Manning. May 74, 84p Rept no. R7185
Contract DAAH01-74-C-0388

Descriptors: *Optical target designators, *Area coverage, *Neodymium lasers, Yttrium aluminum garnet, Glass, Infrared lasers, Q switching, Transmitter receivers.
Identifiers: YAG lasers, Neodymium glass lasers, Design.

The design concept for a laser cueing designator system is described wherein the objective is to arrive at a very low cost laser design which would permit the use of a laser for cueing of targets. The objective is not precise laser designation of tactical targets such as vehicles, but rather the designation of target areas to attacking forces. A laser receiver would provide direction-of-arrival information to the designated target. The final laser design concept resulted in a five pound cueing laser having an estimated unit price of $500 in quantities of 5000; and $1,000 in quantities of 100. (Modified author abstract)

19F. Guns

AD-780 765/4GA PC$3.75/MF$1.45
S and D Dynamics Inc Huntington N Y
MUZZLE BRAKE ANALYSIS.
Technical rept.,
Martin T. Soifer. Jun 74, 67p Rept no. TR-73-6 WVT-CR-74010
Contract DAAF07-73-C-0541

Descriptors: *Gun barrels, *Muzzle brakes, Flow fields, Obturation(Ballistics), Pressure, FORTRAN, Momentum transfer, Computer programs.
Identifiers: FORTRAN 4 programming language, CDC 6600 computers.

A relatively simple mathematical model, and computer program, has been developed for the purposes of estimating the instantaneous pressure distribution, momentum transfer, and braking force, experienced at the surface of a muzzle brake element exposed to the gas flow emanating from the muzzle of a gun tube. The flow field model is established by assuming the existence of quasi-steady flow conditions, and superposing a constant longitudinal velocity component upon the radial gas velocity as defined by the cylindrical blast wave solution of Sakurai. The flow field model is combined with Newtonian impact theory to obtain the instantaneous pressure distribution. (Modified author abstract)

AD-780 938/7GA PC$3.75/MF$1.45
Midwest Research Inst Kansas City Mo
MEASUREMENT OF TRANSIENT BORE-SURFACE TEMPERATURES IN 7.62MM GUN TUBES.
Technical rept.,
C. E. Moeller, and A. J. Bassert. Nov 73, 72p RIA-R-RR-T-1-81-73
Contract DAAF03-70-C-0045

Descriptors: *Machine guns, *Gun barrels, Temperature, Erosion, Firing tests(Ordnance).
Identifiers: M-60 guns(7.62-MM).

As a segment of a gun tube erosion analysis program, techniques were studied to measure transient bore-surface temperatures in 7.62MM M60 machine gun barrels. Rapid-response surface thermocouples (Chromel/Alumel and iron/nickel) were used with high-speed recorders and playback systems to follow the rise and decay characteristics of the pulsed heating phenomenon during firing. (Modified author abstract)

19G. Rockets

AD-780 544/3GA PC$3.75/MF$1.45
Boston Univ Mass Engineering Labs
AERODYNAMIC CHARACTERISTICS OF SOUNDING ROCKETS WITH ATTACHED GERDIAN CONDENSERS FROM MACH 2.5 TO 8,
Paul Soohoo, Rocco Girolamo, and Daniel G. Udelson. Mar 74, 68p Rept no. Scientific-2 AFCRL-TR-73-0495
Contract F19628-71-C-0209

Descriptors: *Sounding rockets, *Aerodynamic characteristics, Aerodynamic loading, Aerodynamic forces, Instrumentation, Wind tunnel models.
Identifiers: Tomahawk rockets, Gerdian condensers.

An investigation has been conducted in the 4 in x 4 in supersonic wind tunnel at Boston University to determine the aerodynamic characteristics of a Tomahawk sounding rocket with attached gerdian condensers for a flight region of Mach 2.5 to 8. The angle of attack was varied from about -2.5 degrees to 2.5 degrees and zero sideslip was maintained. Results are presented showing the variation of the longitudinal stability with Mach number and roll angle of the condensers. No unstable configuration was found within the testing range of the present investigation. The aerodynamic forces were also determined. (Author)

AD-780 951/0GA PC$4.50/MF$1.45
Texas Univ Austin Dept of Aerospace Engineering and Engineering Mechanics
EXPERIMENTAL STUDY OF FLOW FIELD PRODUCED WHEN AN UNDEREXPANDED JET EXHAUSTS INTO A CONSTRICTIVE, STEPPED LAUNCH TUBE,
John J. Bertin, M. Kathy Horn, and Thomas L. Webber. Jan 74, 112p Rept no. 74002
Contract DAAH01-73-C-1016

Descriptors: *Rocket launchers, *Launch tubes, *Flow fields, Exhaust flames, Exhaust gases, Shock waves, Supersonic nozzles, Cold flow, Jets.

An underexpanded, supersonic jet of cold nitrogen was exhausted into a constrictive, stepped launch tube. For one launch tube, the reduction in cross section was accomplished abruptly by a rectangular step. For the other launch tube, the reduction in cross section was accomplished gradually by a 15 degree-ramp. Thirty-seven static-pressure orifices were located along the walls of the two tubes. By varying the location of the nozzle exit-plane with respect to the step location, one could simulate (in a quasi-steady manner) the effect of movement of the rocket through the launch tube. Pitot probes located in the annular region between the simulated rocket-nozzle and the launch tube provided information about the reverse, or blow-by, flow created when the nozzle exhaust encountered the constriction. (Modified author abstract)

20. PHYSICS

20A. Acoustics

AD-781 170/6GA PC$6.25/MF$1.45
Army Foreign Science and Technology Center Charlottesville Va
ANALYSIS OF MEASUREMENT SIGNALS.
22 May 74, 63p Rept no. FSTC-HT-23-1779-73
Trans. of mono. Akusticheskie Izmereniya, Moscow, 1971 p118-167, by Griswold.

Descriptors: *Acoustics, Analyzers, Signals, Spectrum analysis, Translations, USSR.

When performing spectral analysis, a number of important factors must be considered: response of the measuring circuits, frequency range of analysis, etc. The characteristics of standard analyzers are presented and discussed. Correlational analysis of acoustic processes is discussed and standard correlational analyzers are described. Statistical analysis is important in the field of random processes. Nonlinear distortions must be measured and taken into account.

N74-21898/3GA PC$16.25/MF$1.45
General Electric Co., Philadelphia, Pa.
A FORWARD SPEED EFFECTS STUDY ON JET NOISE FROM SEVERAL SUPPRESSOR NOZZLES IN THE NASA/AMES 40- BY 80-FOOT WIND TUNNEL.
Final Report.
M. R. Beulke, W. S. Clapper, E. O. Mccann, and H. M. Morozumi. 3 May 74, 264p NASA-CR-114741
Contract NAS2-7457

Descriptors: *Aerodynamic noise, *Ejectors, *Jet flow, *Noise intensity, *Noise propagation, *Nozzle flow, *Wind tunnel tests, Acoustic measurements, Acoustic properties, Air flow, Flow distribution.

For abstract, see STAR 1213

N74-22323/1GA PC$4.25/MF$1.45
Hydrospace-Challenger, Inc., San Diego, Calif.
NOISE MEASUREMENTS AT STOCKTON AIRPORT OBTAINED DURING ENGINEERING EVALUATION OF TWO-SEGMENT APPROACHES IN A DC-8-61 AIRCRAFT.
R. E. Glass. 4 Feb 74, 23p NASA-CR-114740
Contract NAS2-7369

Descriptors: *Acoustic measurements, *Approach, *Dc 8 aircraft, *Landing sites, *Noise intensity, Airports, Effective perceived noise levels, Flight paths, Jet aircraft noise, Noise pollution.

For abstract, see STAR 1213

20B. Crystallography

AD-780 569/0GA Reprint
Washington State Univ Pullman Dept of Chemistry
MOLECULAR SIEVES AS MEDIA FOR GROWING CRYSTALS.
Interim rept.,
J. L. Sansregret, and G. A. Crosby. 1 Nov 73, 4p AFOSR-TR-74-0888
Grant AF-AFOSR-2207-72
Availability: Pub. in Jnl. Crystal Growth, v21 p313-314 Feb 74.

Descriptors: *Single crystals, *Crystal growth, *Metal complexes, *Dextrose, Transition metals, Absorbers(Materials).
Identifiers: Molecular sieves.

A technique is described for growing single crystals of highly insoluble transition-metal complexes from aqueous solution. Commercially available modified dextran is employed as a supporting medium. (Author)

AD-780 603/7GA Reprint
Massachusetts Inst of Tech Lexington Lincoln Lab
CRYSTAL STRUCTURE OF TL3ASSE3,
H. Y-P. Hong, J. C. Mikkelsen, Jr., and G. W. Roland. 31 Jan 74, 6p

Prepared in cooperation with Westinghouse Research and Development Center, Pittsburgh, Pa. Sponsored in part by Department of the Air Force, Washington, D.C.
Availability: Pub. in Materials Research Bull., v9 p365-369 1974.

Descriptors: *Crystal structure, Single crystals, Thallium compounds, Arsenides, Selenides, Crystal growth.
Identifiers: *Thallium arsenides, *Thallium selenides, Rhombohedral lattices.

The structure of Tl3AsSe3, which has been solved by the single-crystal x-ray method, is rhombohedral, with space group R3m and cell parameters a = 9.870(2)A, c = 7.094(3)A, z = 3. A full-matrix least-squares refinement gives weighted R = 0.058. The Se atoms form equilateral triangles around Tl at 3.178A and around As at 2.207A. The structure may be described in terms of units formed from three TlSe3 triangles by corner-sharing. These units share corners to produce a helical arrangement along the c axis. The triangles of AsSe3 are isolated from each other. (Author)

AD-780 781/1GA PC$3.75/MF$1.45
Naval Research Lab Washington D C
CAPILLARITY-LIMITED STEADY-STATE DENDRITIC GROWTH. PART 1. THEORETICAL DEVELOPMENT.
Semifinal rept. Oct 72-Oct 73,
Gerald E. Nash. 24 May 74, 56p Rept no. NRL-7679
See also Part 2, AD-780 782.

Descriptors: *Dendritic structure, *Crystal growth, *Solidification, Capillarity, Metals, Diffusion, Microstructure, Phase transformations, Supercooling, Numerical analysis, Differential equations.

A set of integro-differential equations describing steady-state nonisothermal dendritic growth is developed via a time-dependent approach. The steady-state equations are studied in detail for the case of isotropic, capillarity-limited growth, and it is shown that the equations assume a form particularly suitable for solution by successive linearization about the known isothermal solution. Of major importance is that the conditions necessary for the existence of a solution to the linearized equations provide a theoretical estimate of the relationship between growth rate and supercooling. (Author)

AD-780 782/9GA PC$3.25/MF$1.45
Naval Research Lab Washington D C
CAPILLARITY-LIMITED STEADY-STATE DENDRITIC GROWTH. PART 2. NUMERICAL RESULTS.
Final rept. on phase 1,
Gerald E. Nash. 28 Mar 74, 33p Rept no. NRL-7680
See also Part 1, AD-780 782.

Descriptors: *Dendritic structure, *Crystal growth, *Solidification, Capillarity, Metals, Diffusion, Supercooling, Microstructure, Differential equations, Numerical integration.

The linearized equations describing nonisothermal, steady-state dendritic growth are solved numerically and the relation between growth rate and supercooling is ascertained. The theoretically predicted growth rates agree with those predicted by the 'modified Ivantsov' analysis at high supercoolings and are higher than those predicted by the Bolling-Tiller-Temkin approach (by a factor of 2.3 at low supercoolings). (Modified author abstract)

CEA-CONF-2512 PC$3.00/MF$1.45
Cea Centre d'Etudes Nucleaires de Fontenay-aux-Roses, 92 (France).
EXPERIMENTAL METHOD FOR THE STUDY OF THE DISLOCATION LOOP NUCLEUS: DETERMINATION OF ITS SIZE.
J. Leteurtre, J. L. Pouchou, L. Zuppiroli, and J. Y. Bounaud. 1973, 11p CONF-730669-2
In French.

Descriptors: (*Dislocations, *Measuring methods), (*Monocrystals, *Physical radiation effects), Anisotropy, Burgers vector, Dimensions, Nucleation, Size, Stresses.

For abstract, see NSA 30 01, number 00857.

COO-1790-6 PC$5.00/MF$1.45
Minnesota Univ., Minneapolis (Usa). Dept. Of Chemical Engineering and Materials Science.
"IN-SITU" ELECTRON MICROSCOPE INVESTIGATION OF THE NUCLEATION AND GROWTH OF SPUTTERED THIN FILMS. ANNUAL TECHNICAL PROGRESS REPORT VI.
T. E. Hutchinson, J. Maa, and J. I. Lee. 15 Jan 74, 40p
Contract AT(11-1)-1790

Descriptors: (*Silicon, *Substrates), (*Gold, *Coatings), (*Silver, Coatings), Crystal growth, Films, Interactions, Monocrystals, Nucleation, Recrystallization, Sputtering.

For abstract, see NSA 30 01, number 02322.

COO-2212-2 PC$14.00/MF$1.45
Minnesota Univ., Minneapolis (Usa). Dept. Of Chemical Engineering and Materials Science.
STUDY OF DISLOCATION DYNAMICS ASSOCIATED WITH DUCTILE--BRITTLE TRANSITION AND HYDROGEN EMBRITTLEMENT PHENOMENA OBSERVED IN BCC METALS. ANNUAL TECHNICAL PROGRESS REPORT II.
W. W. Gerberich, and D. G. Atteridge. Mar 74, 220p
Contract AT(11-1)-2212

Descriptors: (*Hydrogen, *Metallurgical effects), (*Metals, *Fractures), (*Bcc lattices, *Brittle-ductile transitions), (*Iron base alloys, Brittle-ductile transitions), Acoustic emission testing, Cracks, Diffusion, Dislocations, Embrittlement, Research programs.

For abstract, see NSA 30 01, number 00865.

N74-22383/5GA PC$11.00/MF$1.45
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
SOLID STATE POLYMERIZATION AND CRYSTALLOGRAPHY OF POLYIMIDE PRECURSORS.
Ph.D. Thesis - Va. Univ.
N. T. Wakelyn. May 74, 160p NASA-TM-X-70044

Descriptors: *Crystallography, *Polymerization, Infrared spectroscopy, Monomers, Polymer chemistry, Single crystals, X ray analysis.

For abstract, see STAR 1213

N74-22389/2GA PC$4.25/MF$1.45
Laboratoire Central de Recherches Thomson-CSF, Orsay (France).
APPLICATION OF VAPOR PHASE DEPOSITS, USING SEPARATED FLUX COMPONENTS, TO THE DEVELOPMENT OF FERRIMAGNETIC MATERIALS ETUDE D'APPLICATIONS DES DEPOTS EN PHASE VAPEUR AVEC APPORT DE COMPOSANTS EN FLUX SEPARES A LA REALISATION DE MATERIAUX FERRIMAGNETIQUES RAPPORT FINAL.
Final Report.
N. T. Linh. Sep 72, 24p
Contract DGRST-70-7-2570
Language in French.

Descriptors: *Enthalpy, *Ferrimagnetic materials, *Reactor design, *Thermochemistry, *Yttrium-iron garnet, Chemical reactors, Epitaxy, Iron chlorides, Magnetic domains, Oxidation, Reaction kinetics, Vapor phases.

For abstract, see STAR 1213

N74-22390/0GA PC$5.25/MF$1.45
Laboratoire Central de Recherches Thomson-CSF, Orsay (France).
LIQUID PHASE EPITAXIAL PREPARATION OF HIGH PURITY PBSNSE ALLOYS FOR THEIR APPLICATION TO THE INFRARED DETECTION PREPARATION D'ALLIAGES PBSNSE DE TRES HAUTE PURETE PAR EPITAXIE EN PHASE LIQUIDE POUR UTILISATION EN DETECTION INFRAROUGE RAPPORT FINAL.
Final Report.
Oct 72, 43p
Contract DGRST-70-7-2572
Language in French.

Descriptors: *Crystal surfaces, *Epitaxy, *Infrared radiation, *Photovoltaic effect, *Ternary systems, Admixtures, Lead alloys, Liquidus, Phase diagrams, Selenium, Single crystals, Solidus, Stoichiometry, Tin.

For abstract, see STAR 1213

20C. Electricity and Magnetism

PB-232 797/1GA PC$5.40/MF$1.45
California Inst. of Tech., Pasadena, Calif.
SOLUTIONS TO PROBLEMS IN STATIC AND DYNAMIC ELECTRICITY.
Final rept.,
William R. Smythe. Jun 74, 187p* WRS-1893-7-5, (File: CIT-WRS-1893-7-5)

Descriptors: *Static electricity, *Electromagnetism, Problem solving, Magnetostatics, Potential theory, Eddy currents, Antennas, Waveguides, Cavity resonators, Boundary value problems, Numerical integration.

The report is a complete set of solutions to the 679 problems posed in the third edition of 'Static and Dynamic Electricity', (McGraw-Hill, 1968). Of these problems, 581 also appeared in the second edition (1950). The solutions are keyed to both editions. This book has become a classic reference for engineers and physicists working on problems involving electrostatic and magnetostatic potential theory, boundary values, eddy currents, antennas, wave guides, cavity resonators, and the diffraction of electromagnetic radiation. A significant fraction of its reference value resides in the very large collection of problems, solutions to which are presented here. Also included is an extensive errata list for the third edition, first printing.

20D. Fluid Mechanics

AD-780 584/9GA PC$4.50/MF$1.45
Polytechnic Inst of Brooklyn N Y
ON NEAR-EQUILIBRIUM AND NEAR-FROZEN BEHAVIOR OF ONE-DIMENSIONAL FLOW,
Martin H. Bloom, and Lu Ting. Jul 60, 30p Rept no. PIBALR-525 AEDC-TN-60-156
Contract AF-40(600)-732

Descriptors: *One dimensional flow, *Frozen equilibrium flow, Gas dynamics, Inviscid flow, Perturbation theory, Boundary layer, Numerical methods and procedures, Nonequilibrium flow, Models.
Identifiers: *Near equilibrium flow, *Near frozen flow.

Near-equilibrium and near-frozen one-dimensional inviscid flows downstream of an initial station at which the flow is in equilibrium have been examined by means of perturbation analyses. The

near-equilibrium analysis requires the application of boundary layer techniques. The near-frozen analysis is of standard type. It is demonstrated that both types of flow behave in a frozen manner near the initial station. However, the near-equilibrium flow quickly approaches the equilibrium behavior. Examples have been presented for both cases utilizing a dissociating model gas after Lighthill. Representative numerical results are included. (Author)

AD-780 607/8GA PC$3.75/MF$1.45
Advisory Group for Aerospace Research and Development Paris (France)
THEORY OF FLOWS IN COMPRESSIBLE MEDIA WITH HEAT ADDITION,
J. Zierep. May 74, 65p Rept no. AGARD-ograph-191
NATO furnished.

Descriptors: *Compressible flow, *Kinetic theory, *Heat transfer, One dimensional flow, Two dimensional flow, Three dimensional flow, Mass transfer, Momentum transfer, Statistical distributions, Drag reduction, Flow fields, Propulsion systems, Mathematical models, Equations of motion.

A systematic survey is undertaken of the theory of the effect of a given heat addition on the flow of a compressible medium. Here steady flows, both one-dimensional and multi-dimensional, linear and nonlinear, are treated. Consideration is given to addition of mass and momentum to a streamtube as well as of energy. Interesting equivalences arise here. The heat can be distributed continuously in the flow field or added at fronts. For practical applications, the reduction of the drag of a body in flight by heat addition in the flow field is important. At extremely high velocities the problem arises of propulsion by external combustion. Here, the energy is to be transferred directly to the flowing medium, at the high velocity. For the evaluation of such an energy addition, reference is made to the propulsive efficiency, as well as the lift and drag of the body.

AD-780 610/2GA Not available NTIS
National Physical Lab Teddington (England) Ship Div
A COMPARISON OF SOME MODEL AND FULL SCALE HULL BOUNDARY LAYER MEASUREMENTS,
G. E. Gadd. 12 Nov 73, 11p Rept no. NPL-SHIP-179
Availability: Pub. in Proceedings North East Coast Institution of Engineers and Shipbuilders, v90 p51-58 and D15-D16 1973/74.

Descriptors: *Ship hulls, *Hydrodynamics, Model tests, Turbulent boundary layer, Reviews, Experimental data, Theory, Equations of motion, Mathematical models, Great Britain, Flow fields.
Identifiers: Comparative studies.

The paper is divided into four main parts. The first reviews a number of established facts about turbulent boundary layers. The next deals with some model tests, and the following section presents theoretical results for the boundary layer on smooth hull at model and ship scales. The final section discusses full-scale results in relation to the model and theoretical results.

AD-780 611/0GA PC$3.00/MF$1.45
Sydney Univ (Australia) Dept of Aeronautical Engineering
NUMERICAL STUDIES IN GAS DYNAMICS.
Interim scientific rept. 15 Apr 73-14 Apr 74,
G. A. Bird. 15 Apr 74, 5p AFOSR-TR-74-0884
Grant AF-AFOSR-2336-72
See also AD-768 612.

Descriptors: *Gas dynamics, *Numerical methods and procedures, *Scientific research, Mixtures, Flow separation, Shock waves, Pistons, Oscillation, Flow fields, Interactions, Molecules, Computerized simulation, Expansion, Knudsen number, Jet flow, Plumes, Walls, Australia.
Identifiers: *Binary gas mixtures.

Research is reported on separation effects in the flow of binary gas mixtures, and the interaction of a jet with a boundary. Announcement is made of a monograph on molecular gas dynamics.

AD-780 646/6GA PC$3.25/MF$1.45
Wisconsin Univ Madison Mathematics Research Center
RAY METHOD FOR SURFACE WAVES ON FLUID OF VARIABLE DEPTH.
Technical summary rept.,
M. C. Shen. May 74, 36p Rept no. MRC-TSR-1416
Contract DA-31-124-ARO(D)-462

Descriptors: *Surface waves, *Ray tracing, Partial differential equations, Approximation, Shores, Equations of motion.
Identifiers: Geometrical optics, Caustics.

The paper reports some recent developments in ray method for surface waves on fluid of variable depth. The linear ray method, which fails at a shoreline and a caustic, is improved by means of uniform asymptotic expansions. In the nonlinear ray method, an equation of the Korteweg-DeVries type is derived along a ray for fluid domains slowly varying in the directions and one direction. (Author)

AD-780 691/2GA PC$3.00/MF$1.45
Naval Ordnance Lab White Oak Md
INTERACTING SUPERSONIC TURBULENT BOUNDARY LAYERS OVER A TWO-DIMENSIONAL PROTUBERANCE.
Technical rept.,
Arnold Polak. 21 Jan 74, 25p Rept no. NOLTR-74-16

Descriptors: *Aircraft protuberances, *Supersonic characteristics, Surface properties, Turbulent boundary layer, Two dimensional flow, Interactions, Pressure, Aerodynamic heating, Flow fields.

The report presents a numerical study of attached interacting supersonic turbulent boundary layers over a two-dimensional protuberance. Results are presented in terms of surface pressure, heat transfer and skin-friction distributions. These results indicate a strong effect of the size of the protuberance, Mach number, but a weak effect of Reynolds number and the ratio of wall-to-recovery temperature. The peak heating rates from a set of test cases compare well to a semi-empirical prediction method. In contradistinction to the laminar case, the turbulent recovery zone downstream of the protuberance is very short. (Author)

AD-780 710/0GA PC$3.25/MF$1.45
Army Missile Command Redstone Arsenal Ala Aeroballistics Directorate
THE VISCOUS INTERACTION OF INCOMPRESSIBLE SEPARATED FLOWS (REVISED EDITION).
Technical rept.,
Wen L. Chow, and Donald J. Spring. 31 May 74, 29p Rept no. RD-73-22
Supersedes AD-767 236.

Descriptors: *Flow separation, *Incompressible flow, *Two dimensional flow, Viscous flow, Inviscid flow, Turbulence, Conformal mapping, Partial differential equations, Numerical integration.

A mathematical model for the calculation of the viscous interaction of incompressible flows is derived. The particular application discussed is for two-dimensional, incompressible flows over a back step. Use is made of conformal mapping and free-streamline theory in conjunction with a reattachment analysis previously derived for supersonic flows. (Author)

AD-780 721/7GA PC$4.00/MF$1.45
Purdue Univ Lafayette Ind School of Mechanical Engineering
TRANSONIC FLOW COMPUTATION IN ANNULAR AND UNSYMMETRIC TWO-DIMENSIONAL NOZZLES.
Interim rept. 26 Aug 71-30 Jun 73,
H. Doyle Thompson, and Ronald D. Flack. 28 Dec 73, 91p RD-73-21
Contract DAAH01-72-C-0089

Descriptors: *Nozzle gas flow, Annular nozzles, Flow fields, Transonic flow, Plug nozzles, Mathematical models, Computer programming.

An analytical model has been formulated and a computer program has been developed to compute the transonic flow field in either two-dimensional or annular axisymmetric nozzles. The analytical model assumes the inviscid, irrotational flow of a perfect gas, and is based on a Taylor series expansion around a Mach number of unity. An expansion parameter, epsilon is defined in terms of the wall geometry at the minimum area cross section. The method is capable of treating unsymmetric wall geometries. First, second, or third order solutions can be obtained from the computer program. (Modified author abstract)

AD-780 722/5GA PC$3.25/MF$1.45
Purdue Univ Lafayette Ind School of Mechanical Engineering
A HIGH FREQUENCY BURST SIGNAL PROCESSOR FOR LASER VELOCIMETER APPLICATIONS.
Interim rept. 26 Aug 71-30 Jun 73,
Ronald E. Zammit, Michael K. Pedigo, and Warren H. Stevenson. 31 Jan 74, 47p RD-CR-74-4
Contract DAAH01-72-C-0089

Descriptors: *Laser velocimeters, *Signal processing, Nozzle gas flow, Transonic flow, Two dimensional flow, Doppler effect, Spectrum analyzers.

Different types of Laser Doppler Anemometer (LDV) processors are discussed. The electronic circuit for a Doppler burst processor developed at Purdue University is described in detail. In use with a differential Doppler LDV optical system, this circuit provide a data rate up to 100 KHz, with a maximum of 100 MHz. Doppler frequency, results of preliminary velocity measurements in a two-dimensional transonic nozzle are presented. (Author)

AD-780 824/9GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
ON ACOUSTIC EFFICIENCY OF SUPERSONIC ANNULAR JETS,
V. O. Lyutii. 4 Jun 74, 9p Rept no. FTD-HC-23-904-74
Edited trans. of Akademiya Nauk URSR, Kiev. Dopovidi. Seriya A: Fiziko-Tekhnichni ta Matematichni Nauki, n5 p454-457 1972.

Descriptors: *Jet flow, *Supersonic characteristics, *Annular nozzles, *Acoustic properties, Efficiency, Mathematical models, Force level, Translations, USSR.

Acoustic emission of a supersonic annular jet takes place both into the space surrounding the jet and into the inner area, which is formed by a central nozzle body with an annular critical cross section. The level of emission into the outside sonic space probably does not differ in any way from the level of acoustic emission of a single supersonic cylindrical jet. Hence, the total power of an acoustic emission will be equal to the acoustic emissions of the annular jet into an outside space and toward the bottom edge of the central body.

AD-780 867/8GA PC$4.00/MF$1.45
Denver Research Inst Colo Div of Mathematical Sciences

AN ANALYSIS OF SCALING FOR LINEAR INVISCID INTERNAL WAVES.
Final rept.,
N. Bleistein, and J. K. Cohen. 24 Jul 73, 22p Rept no. MS-R-7401A
Contract N00014-67-A-0394-0005
Supersedes AD-764 579.

Descriptors: *Fluid flow, *Internal waves, Ocean waves, Atmospheric motion, Ray tracing, Approximation, Perturbation theory.
Identifiers: Boussinesq approximation.

A consistent scaling is developed for the study of linear inviscid internal waves in the ocean, the atmosphere or experimental tanks. There are scales to characterize the linearization, the slow variation of the amplitude, the stratification scale, modal versus nonmodal flow and transverse variation of the ambient density and pressure. Observations in the ocean, the atmosphere and tank experiments are cited both for motivation and corroboration. (Author)

AD-780 950/2GA PC$4.75/MF$1.45
Pennsylvania State Univ State College Applied Research Lab
THE EFFECT OF GAS DIFFUSION AND VAPORIZATION ON THE ENTRAINMENT COEFFICIENT FOR A VENTILATED CAVITY.
Technical memo.,
Michael L. Billet, and Donald S. Weir. 24 Jan 74, 31p Rept no. TM-74-15
Contract N00017-73-C-1418, Grant NGL-39-009-001

Descriptors: *Cavitation, *Fluid dynamics, Cavities, Ventilation, Gas dynamics, Diffusion, Flow rate, Mathematical models, Statistical analysis, Model tests, Scaling factors, Equations of motion, Flow fields.
Identifiers: *Ventilated cavities.

A method is presented for determining the effect of gas diffusion and vaporization on the volume flowrate of gas needed to sustain a ventilated cavity. The analysis for the gas diffusion effect is based on a mathematical model of diffusion which accounts for changes in flow velocity, body scale, model geometry, and air content. Experimental studies compare favorably with the analysis. Also, a scaling relationship is proposed for ventilated cavity flows. (Author)

AD-781 166/4GA PC$5.75/MF$1.45
Army Foreign Science and Technology Center Charlottesville Va
SOME PROBLEMS IN THE THEORY OF AEROSOL PARTICLE SETTING FROM A FLOW,
N. V. Klepikova, L. M. Levin, and Yu. S. Sedunov. 18 Apr 74, 51p Rept no. FSTC-HT-23-2045-72
Trans. of Institut Prikladnoi Geofiziki, Leningrad. Trudy (USSR) n7 p88-115 1967.

Descriptors: *Aerosols, *Particles, *Fluid flow, Equations of motion, Mathematical models, Concentration(Composition), Viscous flow, Fluid dynamics, Separation, Translations, USSR, Problem solving.

Equations are studied which describe the behavior of aerosol particles in a flow. The changes in the concentration of particles in the flow are studied as well as the settling of particles from a quasihyperbolic flow, from a potential flow, and a viscous flow near the line of symmetry. A method for solving a second-order equation with a small parameter in the highest order derivative is proposed. The results of numerical computations are given. (Author)

AECL-4752 PC$5.00/MF$1.45
Gosudarstvennyj Komitet Po Ispol'Zovaniyu Atomnoj Ehnergii Sssr, Obninsk. Fiziko-Ehnergeticheskij Inst.
CALCULATION OF HEAT-TRANSFER CRISIS FOR ANNULAR TWO-PHASE FLOW OF A STEAM--LIQUID MIXTURE THROUGH AN ANNULAR CHANNEL.
P. L. Kirillov, and I. P. Smogalev. Feb 74, 37p
Translation of FEI--297.

Descriptors: (*Steam. Two-phase flow), (*Water, Two-phase flow), (*Two-phase flow, *Dryout), Annular space, Heat transfer, Numerical solution.

For abstract, see NSA 30 01, number 00246.

COO-3284-3 PC$4.00/MF$1.45
Johns Hopkins Univ., Baltimore, MD. (Usa). Dept. Of Mechanics and Materials Science.
RESEARCH ON TURBULENT DIFFUSION. FINAL REPORT.
S. Corrsin. 16 Mar 74, 12p
Contract AT(11-1)-3284

Descriptors: Boundary layers, Diffusion, Fluid flow, Shear, Turbulence, Turbulent flow.

For abstract, see NSA 30 01, number 02394.

N74-21923/9GA PC$7.00/MF$1.45
Boston Univ., Mass. Dept. of Aerospace Engineering.
A FINITE-ELEMENT FORMULATION FOR SUBSONIC FLOWS AROUND COMPLEX CONFIGURATIONS.
L. Morino. Dec 73, 79p NASA-CR-138142, TR-73-05
Contract NGR-22-004-030

Descriptors: *Boundary layer flow, *Finite element method, *Flow characteristics, *Potential flow, *Subsonic flow, Air flow, Flow equations, Mathematical models, Numerical analysis.

For abstract, see STAR 1213

N74-21924/7GA PC$6.25/MF$1.45
Virginia Univ., Charlottesville. Dept. of Engineering Science and Systems.
TOPICS IN STRUCTURAL DYNAMICS: NONLINEAR UNSTEADY TRANSONIC FLOWS AND MONTE CARLO METHODS IN ACOUSTICS.
Final Report.
J. K. Haviland. Feb 74, 63p NASA-CR-138110, ESS-4022-113-74
Contract NGL-47-005-108

Descriptors: *Acoustics, *Monte carlo method, *Transonic flow, *Unsteady flow, Green function, Kernel functions, Nonuniform flow, Perturbation, Ray tracing.

For abstract, see STAR 1213

N74-21925/4GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
AN EXPLORATORY INVESTIGATION OF A WAKE DISRUPTION TECHNIQUE FOR STUDYING WAKE REESTABLISHMENT TIME.
L. E. Clark, and R. A. Jones. May 74, 18p NASA-TM-X-2961, L-9199

Descriptors: *Hypersonic flow, *Hypersonic wakes, *Turbulent wakes, *Wind tunnel tests, Blowdown wind tunnels, Flow characteristics, Flow visualization, Schlieren photography.

For abstract, see STAR 1213

N74-21926/2GA PC$4.00/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
CALCULATION OF SUPERSONIC STREAM PARAMETERS OF A REAL GAS FROM MEASURABLE QUANTITIES USING FORTRAN 4 ROUTINES.
R. C. Johnson. Apr 74, 90p NASA-TN-D-7653, E-7643

Descriptors: *Flow measurement, *Hypersonic flow, *Real gases, *Supersonic flow, *Thermodynamic properties, Argon, Computer programs, Fortran, Helium, Hydrogen, Oxygen.

For abstract, see STAR 1213

N74-21927/0GA PC$14.50/MF$1.45
Scientific Translation Service, Santa Barbara, Calif. Ph.D. Thesis - Karlsruhe Univ.
A PROCEDURE FOR THE DIRECT NUMERICAL SIMULATION OF TURBULENT FLOWS IN PLATE AND ANNULAR CHANNELS AND ITS APPLICATION IN THE DEVELOPMENT OF TURBULENCE MODELS.
U. Schumann. Apr 74, 227p NASA-TT-F-15391
Contract NASW-2483
Tran-Transl. Into English from German Ph.D. Thesis, Kernforschungszentrum Report, Karlsruhe, 1973 p 1-249.

Descriptors: *Computer programs, *Incompressible fluids, *Three dimensional flow, *Turbulent flow, Flow equations, Mathematical models, Navier-stokes equation, Numerical analysis.

For abstract, see STAR 1213

N74-21928/8GA PC$3.25/MF$1.45
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
AN EXPERIMENTAL INVESTIGATION OF WALL BOUNDARY LAYER TRANSITION REYNOLDS NUMBERS IN AN EXPANSION TUBE.
K. J. Weilmuenster. May 74, 30p NASA-TN-D-7541, L-9337

Descriptors: *Boundary layer transition, *Gas flow, *Pressure distribution, *Pressure measurements, Flow characteristics, Flow equations, Pipes (Tubes).

For abstract, see STAR 1213

N74-21929/6GA PC$11.50/MF$1.45
United Aircraft Corp., East Hartford, Conn. Research Labs.
A WEAK INTERACTION STUDY OF THE VISCOUS FLOW ABOUT OSCILLATING AIRFOILS.
S. J. Shamroth, and J. P. Kreskovsky. May 74, 167p NASA-CR-132425
Contract NAS1-11568

Descriptors: *Airfoils, *Inviscid flow, *Stable oscillations, *Viscous flow, *Wind tunnel tests, Aerodynamic characteristics, Flow distribution, Flow equations, Numerical analysis.

For abstract, see STAR 1213

N74-21930/4GA PC$4.75/MF$1.45
National Aeronautical Lab., Bangalore (India). Information Centre for Aeronautics.
ON LAMINAR SEPARATION.
V. V. Sychev. Jan 74, 31p NAL-TT-3
Tran-Transl. Into English from Izv. Akad. Nauk Sssr, Mekh. Zhidk. Gaza (Ussr), No. 3, 1972 p 47-59.

Descriptors: *Incompressible fluids, *Laminar flow, *Separated flow, *Solids, Free flow, Pressure gradients, Reynolds number.

For abstract, see STAR 1213

N74-21931/2GA PC$6.00/MF$1.45
Aeronautical Research Labs., Melbourne (Australia).
A METHOD FOR CALCULATING INVISCID SEPARATED FLOW ABOUT CONICAL SLENDER BODIES.
D. I. Pullin. May 73, 57p ARL/A-REPT-140

Descriptors: *Conical bodies, *Inviscid flow, *Separated flow, *Slender bodies, Flow characteristics, Flow equations, Numerical analysis.

For abstract, see STAR 1213

N74-21932/0GA PC$5.25/MF$1.45
National Aeronautical Establishment, Ottawa (Ontario).
WALL INTERFERENCE ON TWO DIMENSIONAL SUPERCRITICAL AIRFOILS, USING WALL PRESSURE MEASUREMENTS TO DETERMINE THE POROSITY FACTORS FOR TUNNEL FLOOR AND CEILING.
Aeronautical Report.
M. Mokry, P. J. Peake, and A. J. Bowker. Feb 74, 44p NRC-13894, LR-575

Descriptors: *Flow characteristics, *Two dimensional flow, *Wall flow, *Wind tunnels, Aerodynamic configurations, Airfoils, Pressure distribution.

For abstract, see STAR 1213

N74-21933/8GA PC$4.75/MF$1.45
Technion - Israel Inst. of Tech., Haifa. Dept. of Aeronautical Engineering.
ANALYSIS OF CYLINDERS ROTATING WITHIN MODERATE CLEARANCE RATIOS.
O. Pinkus, and I. Etsion. Dec 73, 34p TAE-192

Descriptors: *Cylindrical bodies, *Flow characteristics, *Fluid flow, *Incompressible fluids, *Rotating fluids, Navier-stokes equation, Numerical analysis, Rotating cylinders.

For abstract, see STAR 1213

N74-21934/6GA PC$4.50/MF$1.45
National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
NUMERICAL SOLUTION OF THE TIME-DEPENDENT COMPRESSIBLE NAVIER-STOKES EQUATIONS IN INLET REGIONS.
L. E. Olson, P. R. Mcgowan, and R. W. Maccormack. Mar 74, 30p NASA-TM-X-62338

Descriptors: *Compressibility effects, *Intake systems, *Navier-stokes equation, *Problem solving, *Viscous flow, Finite difference theory, Flow distribution, Numerical analysis, Time dependence.

For abstract, see STAR 1213

N74-21935/3GA PC$4.25/MF$1.45
Texas A&M Univ., College Station. Dept. of Aerospace Engineering.
THE APPLICATION OF RIEGELS' RULE AND TIME-LIKE DAMPING TO TRANSONIC FLOW CALCULATIONS.
D. L. Herron. Apr 74, 24p NASA-CR-138181, TAMRF-3033-7401
Contract NGR-44-001-157
Conf-Presented at the 22D Aiaa Southwestern Student Paper Competition, Arlington, Tex.

Descriptors: *Aerodynamic characteristics, *Airfoils, *Flow distribution, *Thin wings, *Transonic speed, Finite element method, Flow equations, Numerical analysis.

For abstract, see STAR 1213

N74-21936/1GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
COMPARISON OF MEASURED AND CALCULATED VELOCITY PROFILES OF A LAMINAR INCOMPRESSIBLE FREE JET AT LOW REYNOLDS NUMBERS.
G. C. Greene. May 74, 20p NASA-TN-D-7510, L-9277

Descriptors: *Boundary layer flow, *Incompressible flow, *Laminar flow, *Nozzle flow, Flow characteristics, Flow equations, Numerical analysis, Velocity distribution.

For abstract, see STAR 1213

N74-21937/9GA PC$3.25/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
WICKING OF LIQUIDS IN SCREENS.
E. P. Symons. May 74, 33p NASA-TN-D-7657, E-7781

Descriptors: *Capillary flow, *Fluid flow, *Weightlessness, *Wicks, Flow characteristics, Flow measurement, Materials tests, Screens.

For abstract, see STAR 1213

N74-21938/7GA PC$3.25/MF$1.45
Princeton Univ., N.J.
DISCRETE WALL JETS IN QUIESCENT AIR.
J. D. Mclean, and H. J. Herring. May 74, 45p NASA-CR-2388
Contract NGL-31-001-074

Descriptors: *Flow characteristics, *Jet flow, *Nozzle flow, *Turbulent flow, Flow measurement, Jet impingement, Velocity distribution, Wall flow.

For abstract, see STAR 1213

N74-21940/3GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
EFFECT OF THROTTLING ON INTERFACE BEHAVIOR AND LIQUID RESIDUALS IN WEIGHTLESSNESS.
E. P. Symons. May 74, 21p NASA-TM-X-3034, E-7833

Descriptors: *Liquefied gases, *Throttling, *Weightlessness, Liquid-vapor interfaces, Tanks (Containers).

For abstract, see STAR 1213

20E. Masers and Lasers

AD-780 594/8GA PC$4.00/MF$1.45
Gte Sylvania Inc Mountain View Calif
FREQUENCY-DOUBLED NEODYMIUM-YAG PUMPED DYE STUDY.
Final rept. Mar-Sep 73,
Eugene O. Ammann, C. David Decker, and Joel Falk. Apr 74, 87p AFWL-TR-73-280
Contract F29601-73-C-0067

Descriptors: *Dye lasers, Optical pumping, Neodymium lasers, Frequency multipliers, Cesium compounds, Deuterium compounds, Arsenic compounds.
Identifiers: YAG lasers, Second harmonic generation, Cesium dihydrogen arsenates, Infrared upconversion.

The goal of this program was to obtain 125 mJ (minimum) pulses in the .53 to .70 micrometer region of the spectrum. It was originally envisioned by the AFWL in their RFP that this goal would be accomplished by frequency doubling the 1.32 micrometer output from a pulsed Nd:YAG laser system. However, such an approach is difficult for at least two reasons. First, competition from the 1.06 micrometer transition in Nd:YAG makes it difficult to obtain the required 1.32 micrometer pulse energies in a low-order transverse mode. Secondly, a damage resistant, 90 degree phase-matchable nonlinear crystal for doubling 1.32 micrometer is not readily available. Thus the approach which was recommended in our proposal and which was followed on this program was to (1) generate 1.06 micrometer pulses with a Nd:YAG oscillator/amplifier chain, (2) generate second-harmonic pulses at .53 micrometer using deuterated cesium dihydrogen arsenate as the nonlinear material, and (3) use the 0.53 micrometer pulses to pump a dye laser.

AD-780 622/7GA PC$3.00/MF$1.45
Air Force Cambridge Research Labs L G Hanscom Field Mass
THE HYDROGEN DISSOCIATION LASER.
Physical sciences research papers,
Arthur Cohn, Allen G. Rubin, and Arthur L. Besse. 5 Apr 74, 13p Rept nos. AFCRL-TR-74-0110, AFCRL-PSRP-592

Descriptors: *Gas lasers, Hydrogen, Dissociation, Photoionization, Visible spectra, Excitation, Electron irradiation, Electron irradiation.
Identifiers: *Hydrogen lasers.

The H2 dissociation laser buffered with argon using electron beam excitation is considered. The argon buffer greatly increases the light output from the upper laser level, compared with pure hydrogen. It does this by absorbing much more of the electron beam energy, and by transferring it more efficiently to the upper laser level. Upper laser level densities of 3 x 10 to the 13th power per cc are experimentally obtained. This should be sufficient for practical gain if auxiliary loss processes such as photoionization absorption do not cancel the gain. This problem has not yet been determined. If these adsorption processes are within estimated bounds, an energy density of approximately 5 joules per liter, over a pulse time of about 10 nsec, at an efficiency of about 10 percent for tunable radiation in the 0.4- to 0.6- micrometer wavelength range is predicted. (Author)

AD-780 631/8GA PC$10.00/MF$1.45
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Engineering
PRESSURE PRODUCED BY VAPORIZATION AS A MECHANISM FOR REMOVING MELT FROM A TARGET SUBJECTED TO LASER RADIATION.
Master's thesis,
Martin M. Bittner. Mar 74, 138p Rept no. GAW/MC/74-11

Descriptors: *Laser beams, *Heating, Titanium, Aluminum, Vaporization, Vapor pressure, Thermophysical properties, Heat transmission, Theses.
Identifiers: *Laser heating.

An analysis was made of the effect of pressure generated by vaporization of the surface of a thin slab irradiated with a high intensity laser beam. A finite element analysis was used to obtain numerical solutions of the heat and flow equations, and a computer program was developed to perform the required calculations. Titanium and aluminum slabs 0.08 and 0.127 cm thick were analyzed for response to pressure effects using peak absorbed intensities of 10,000 to 140,000 watts/sq cm. Pressures in the low pressure regime were predicted by the model, and the model predicted that melt removal afrom the area of flux incidence occurred. The most significant effect was a reduction in time required to melt the rear surface of the slab over the time computed on a strictly two dimensional heat flow analysis. Slab thickness, material properties, and peak absorbed intensities all contributed to the overall effect. (Author)

AD-780 728/2GA PC$3.25/MF$1.45
Harry Diamond Labs Washington D C
STUDIES RELATIVE TO POSSIBLE LASER PUMPED BY NUCLEAR BETA RAYS. II. POWER AND SHIELDING REQUIREMENTS,
Clyde A. Morrison, and Donald E. Wortman. Jan 74, 44p Rept no. HDL-TR-1647
See also AD-775 424.

Descriptors: *Solid state lasers, Excitation, Laser materials, Lithium fluorides, Thulium compounds, Beta particles, Beta decay, Nuclear radiation.
Identifiers: Thulium fluorides.

An investigation has been made of problems that would be encountered in providing for and using the nuclear power from the beta decay of Tm170 to pump a rare-earth ion laser. The Tm170 is to be created by bombarding LiTmF4 containing stable Tm169 by thermal neutrons. The rare earth impurity ion selected for the laser will substitute for a small amount of the thulium. It was found that exposing the LiTmF4 crystal to a thermal neutron flux of 10 to the 14th power/sq cm-sec for 3 days could create a power density within LiTmF4 comparable with that of a 100-W xenon lamp used for optically pumping Ho(3+). The energy level of escaping radiation is low enough so that shielding to insure safe handling without compromising portability can be provided with no great difficulty. Range calculations showed, for example, that the range of 1-MeV electrons in liquid nitrogen is only about 0.5 cm. Low-Z material can be used for shielding the beta rays because of the lower intensity bremsstrahlung that would be created thereby. (Modified author abstract)

AD-780 839/7GA PC$3.00/MF$1.45
Defence Research Establishment Valcartier Quebec
AN EXCITATION CIRCUIT FOR TEA GRID LASER,
J. L. Lachambre, J. Gilbert, and M. Cunningham. Mar 74, 15p Rept no. DREV-TN-2105/74
Summary in French. See also AD-780 840.

Descriptors: *Carbon dioxide lasers, *Excitation, *Pulse amplifiers, Circuits, Gas lasers, Barometric pressure, Gain, Canada.
Identifiers: *TEA lasers.

A novel circuit employing a combination of inductive and capacitive elements designed to excite a double discharge grid-type TEA CO2 laser is described. The electrical and amplification characteristics of the excited medium have been measured. Small-signal gain coefficients up to 0.025/cm were achieved with an electrical energy density of 100 mJ/cc being supplied to the discharge. (Author)

AD-780 840/5GA PC$3.25/MF$1.45
Defence Research Establishment Valcartier Quebec
DOUBLE DISCHARGE TEA LASER BEAMS,
R. Fortin, A. K. Laflamme, and F. Rheault. Mar 74, 34p Rept no. DREV-TN-2109/74
Summary in French. See also AD-780 839.

Descriptors: *Laser beams, Gas lasers, Mathematical models, Gain, Power, Optical properties, Canada.
Identifiers: *TEA lasers.

The energy and power density distributions of a multi-transverse mode laser beam are predicted from a simple theoretical model. The corresponding experimental verifications show a good agreement for both the near and far field behavior of these beams. Finally, a method for optimizing the peak power density in the focal volume of a converging element is suggested. (Author)

AD-780 870/2GA Reprint
Air Force Cambridge Research Labs L G Hanscom Field Mass
CHARACTERISTICS OF THE OPTICAL PARAMETRIC OSCILLATOR AND ITS USE FOR SELECTIVE EXCITATION,
Audun Hordvik, and Philip B. Sackett. 30 Oct 73, 7p Rept no. AFCRL-TR-74-0260
Availability: Pub. in Applied Optics, v13 n5 p1060-1064 May 74.

Descriptors: *Tunable lasers, *Frequency multipliers, Neodymium lasers, Laser beams, Tuning devices, Stability, Bandwidth.
Identifiers: *Parametric oscillators, Infrared upconversion.

Techniques are presented for obtaining stable, single mode output from an optical parametric oscillator and for aligning such an oscillator with a molecular or atomic transition. A line width of 0.001/cm or less was obtained with a long term frequency stability or 0.001/cm or better. It has been demonstrated that an OPO can stay aligned for several hours with an absorption line of half-width 0.01/cm. (Author)

AD-780 888/4GA Reprint
Air Force Cambridge Research Labs L G Hanscom Field Mass
INVESTIGATIONS OF LASER-INDUCED THERMAL LENSING AND INTERFERENCE FROM INFRARED TRANSMITTING MATERIALS,
Bernard Bendow, Lyn H. Skolnik, and Edward F. Cross. 16 Nov 73, 5p Rept no. AFCRL-TR-74-0226
Availability: Pub. in Applied Optics, v13 n4 p729-731 Apr 74.

Descriptors: *Infrared windows, Infrared optical materials, Infrared lasers, Laser beams, Light transmission, Barium compounds, Fluorides.
Identifiers: *Thermal lens effect, *Barium fluorides.

Distortion and interference phenomena in the transmission of high power infrared laser beams through windows are investigated via real-time quantitative measurements from an IR Vidicon detection system. Thermal lensing is observed with BaF2, interference effects with ZnSe, and a combination of the two with Si. These observations are interpreted in light of existing theories. (Author)

AD-780 889/2GA Reprint
Air Force Cambridge Research Labs L G Hanscom Field Mass
INFRARED VIDICON TECHNIQUE FOR MEASURING THERMAL LENSING FROM LASER WINDOWS,
Lyn H. Skolnik, Bernard Bendow, and Edward F. Cross. 16 Nov 73, 6p Rept no. AFCRL-TR-74-0225
Availability: Pub. in Applied Optics, v13 n4 p726-729 Apr 74.

Descriptors: *Infrared windows, Carbon dioxide lasers, Laser beams, Light transmission, Infrared lasers, Laser materials, Silicon, Potassium compounds, Chlorides, Test methods.
Identifiers: *Thermal lens effect, Potassium chloride.

An infrared vidicon technique is described for observation of thermal lensing and interference effects from high power infrared laser windows. As an illustration of the technique, measurements of the temporal evolution of a CO2 laser beam transmitted through Si and KCl windows are displayed. (Author)

AD-781 019/5GA Not available NTIS
National Research Council of Canada Ottawa (Ontario) Div of Physics
PRODUCTION OF SINGLE SUBNANOSECOND MULTI-LINE 10.6 MICROMETER LASER PULSES BY FAST OPTICAL GATING,
M. C. Richardson. 7 Jan 74, 5p NRC-13862
Availability: Pub. in Optics Communications, v10 n4 p302-305 Apr 74.

Descriptors: *Carbon dioxide lasers, *Light pulses, *Shutters(Optics), Infrared lasers, Electrooptics, Infrared optical systems, Canada.
Identifiers: TEA lasers.

An electro-optic shutter, activated by a pulse generator switched with a laser triggered spark gap having a risetime of about 120 psec, has been used to produce optical pulses of variable duration, as short as about 600 psec, from the output of a uv photo-preionized CO2 laser, which simultaneously oscillates on several rotational transitions. (Author)

AD-781 156/5GA PC$3.00/MF$1.45
Army Foreign Science and Technology Center Charlottesville Va
RADIATION FIELD STRUCTURE DURING SYNCHRONIZATION OF TRANSVERSE MODES IN A LASER,
E. S. Kovalenko, and G. G. Kushch. 20 Mar 74, 7p Rept no. FSTC-HT-23-1846-73
Trans. of Izvestiya Vysshikh Uchebnykh Zavedenii. Fizika (USSR) n2(129) p156-158 1973.

Descriptors: *Laser beams, Oscillation, Synchronism, Translations, USSR.

Since synchronization of transverse oscillations of a laser can result in scanning of output radiation, the distribution of amplitudes and phases of transverse modes of laser oscillations was analyzed to correspond closely to conditions in real lasers. It was found that as the synchronized transverse modes increase in number, the modulation of the laser output radiation rises sharply. (Author)

N74-22164/9GA PC$4.00/MF$1.45
California Univ., Berkeley. Dept. of Electrical Engineering.
STUDY OF EXCITATION TRANSFER IN LASER DYE MIXTURES BY DIRECT MEASUREMENT OF FLUORESCENCE LIFETIME.
C. Lin, and A. Dienes. 1973, 13p NASA-CR-138179
Contract NGR-05-003-559

Descriptors: *Dye lasers, *Excitation, *Fluorescence, *Rates (Per time), Optical resonance, Resonance charge exchange.

For abstract, see STAR 1213

N74-22169/8GA PC$5.00/MF$1.45
Israel Inst. of Tech., Haifa. Dept. of Aeronautical Engineering.
ON GAS TEMPERATURE IN COAXIAL ELECTRIC DISCHARGE CO2 FLOW LASERS.
J. Shwartz, and E. Margalith. Dec 73, 38p TAE-191

Descriptors: *Carbon dioxide lasers, *Gas flow, *Laser outputs, *Temperature effects, Data acquisition, Electrical properties, Numerical analysis, Performance tests.

For abstract, see STAR 1213

N74-22175/5GA PC$3.75/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
PARAMETRIC THERMODYNAMIC ANALYSIS OF CLOSED-CYCLE GAS-LASER OPERATION IN SPACE.
R. K. Burns. May 74, 59p NASA-TN-D-7658, E-7801

Descriptors: *Brayton cycle, *Gasdynamic lasers, *Thermodynamic efficiency, Compressors, Heat exchangers, Mathematical models, Supersonic diffusers.

For abstract, see STAR 1213

N74-22182/1GA PC$5.50/MF$1.45
Siemens A.G., Munich (West Germany). Forschungslab.
HIGH POWER CHEMICAL LASERS CHEMISCHE LASER HOHER LEISTUNG.
E. Klement, and H. White. Jan 74, 48p BMFT-FBT-74-01
Subm-Sponsored by Bundesmin. Fuer Forsch. Und Technol.
In German; English Summary.

Descriptors: *Chemical lasers, *High energy electrons, *Laser outputs, *Optical resonators, Fluorine organic compounds, Hydrofluoric acid, Iodine, Ionization, Methane.

For abstract, see STAR 1213

PAT-APPL-412 856 PC$4.00/MF$1.45
Department of the Air Force Washington D C
MULTI-COMPONENT FLOW INJECTOR PUMP FOR A FLOWING GAS LASER WITH LOW OUTPUT PRESSURE.
Patent Application,
Robert W. Milling. Filed 5 Nov 73, 9p Rept no.
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Gas lasers, *Chemical lasers, *Gas pumps.
Identifiers: PAT-CL-330-4-3, *Patent applications.

The patent application describes a pumping system for a chemical laser having a heat exchanger in the output for supplying heat to the diluent carrier gas from a high pressure gas supply. The diluent carrier gas is used to accelerate solid particles which are then separated from the gas stream and used to accelerate the output of the laser. The kinetic energy of the gas stream is then converted to a gas stream pressure in an expanding channel. The solid particles are then removed from the gas and returned to the particle supply.

PATENT-3 791 738 Not available NTIS
Department of the Air Force Washington D C
RING LASER UTILIZING AN OPTICAL RETARDATION PLATE TO PREVENT BEAM LOCKING.
Patent,
Ronald G. Newburgh. Filed 11 Apr 73, patented 12 Feb 74, 5p Rept nos. PAT-APPL-350 260,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Ring lasers, *Patents, Gas lasers, Optical equipment components, Gyroscopes.
Identifiers: PAT-CL-356-106-LR.

The patent describes how ring laser beam locking is substantially eliminated by inserting an optical retardation plate into the circulating laser beams. The retardation plate is positioned with its optical axis perpendicular to the laser beams and is located at a point of minimum distance from the ring laser center of rotation. Further laser beam decoupling is achieved by mechanically vibrating the retardation plate.

SLA-73-1023 PC$6.00/MF$1.45
Sandia Labs., Albuquerque, N.Mex. (Usa).
NUMERICAL SOLUTION FOR ELECTRON-BEAM-CONTROLLED CO SUB 2 LASER PERFORMANCE.
J. B. Moreno. Apr 74, 59p
Contract AT(29-1)-789

Descriptors: (*Carbon dioxide lasers, *Performance), Boltzmann equation, Carbon dioxide, Computer codes, Control systems, Electron beams, Electrons, Lasers, Numerical solution.

For abstract, see NSA 30 01, number 00234.

UCID-16465 PC$4.00/MF$1.45
California Univ., Livermore (Usa). Lawrence Livermore Lab.
CHARACTERIZATION OF A NEODYMIUM GLASS ROD DAMAGED IN THE PLASMA-X LASER.
R. Vandervoort. 29 Mar 74, 16p
Contract W-7405-eng-48

Descriptors: (*Neodymium lasers, *Defects), Impurities, Laser radiation, Reflection, Targets.

For abstract, see NSA 30 01, number 00235.

20F. Optics

AD-780 623/5GA PC$3.00/MF$1.45
Air Force Cambridge Research Labs L G Hanscom Field Mass
FREQUENCY SPECTRUM OF OPTICAL WAVES PROPAGATING IN A MOVING TURBULENT ATMOSPHERE.
Physical sciences research papers,
Ronald L. Fante. 8 Mar 74, 23p Rept nos. AFCRL-TR-0135, AFCRL-PSRP-591

Descriptors: *Light transmission, *Atmospheric motion, Wind, Turbulence, Frequency, Spectra.
Identifiers: *Atmospheric attenuation.

The authors have calculated the frequency spectrum of plane waves and beams propagating in a moving turbulent atmosphere. Both the case when the atmosphere moves with a constant wind and the case when the wind velocity is distributed according to a gaussian centered about some average velocity is considered. The results indicate that for small propagation distances, the frequency spectrum behaves as omega sup -8/3 for large frequency, omega; for large propagation distances, the spectrum is broadened with increasing distance with the broadening dependent upon the beam parameters and the wind velocity. (Author)

AD-780 780/3GA PC$3.25/MF$1.45
Naval Research Lab Washington D C
ARPA-NRL INFRARED INTEGRATED OPTICS PROGRAM ANNUAL TECHNICAL REPORT TO ADVANCED RESEARCH PROJECTS AGENCY.
Rept. for 1 Dec 72-31 Jan 74,
T. G. Giallorenzi, and John Warner. Apr 74, 42p Rept no. NRL-MR-2783
ARPA Order-2327

Descriptors: *Infrared optical systems, *Waveguides, Integrated circuits, Thin films, Magnetooptics, Lithium compounds, Iodates, Yttrium iron garnet, Gadolinium compounds, Gallium compounds, Garnet.
Identifiers: *Optical waveguides, Lithium iodates.

The ARPA-NRL integrated optics program is concerned with the development of an infrared integrated optical technology. The report discusses the NRL in-house program on thin film magneto-optical isolators. Both theoretical and experimental aspects have been studied in detail. (Author)

AD-780 914/8GA PC$4.75/MF$1.45
New Mexico State Univ University Park Dept of Physics
RESEARCH IN THE AREA OF ATMOSPHERIC MODELING: HIGH RESOLUTION ATMOSPHERIC IR TRANSMITTANCE PREDICTION,
August Miller, Robert L. Armstrong, and Charles W. Welch. Jun 74, 126p Rept no. NMSU-PHYS-537-74-1
Contract DAAD07-73-C-0134

Descriptors: *Laser beams, *Light transmission, *Atmospheres, Computer programs, Infrared lasers, Infrared radiation, Absorption spectra, Atmosphere models, FORTRAN.
Identifiers: Atmospheric attenuation, FORTRAN 4 programming language, HIGHTRAN computer program.

The basic elements of line by line prediction of atmospheric transmittance at infrared wavelengths, and the quantum mechanical bases of line parameter computation are reviewed. A FORTRAN IV(G) computer program using the AFCRL Atmospheric Absorption Line Parameters Data Compilation tape for high resolution transmittance prediction under homogenous conditions is presented together with running instructions. An analysis of the effects of the using collisionally narrowed line profiles rather than simple Lorentzian profiles is also included, and suggests that collisional-narrowing may be significant with certain types of transmission paths. (Author)

AD-781 013/8GA PC$13.50/MF$1.45
Army Foreign Science and Technology Center Charlottesville Va
SCATTERING AND ABSORPTION OF LIGHT IN THE ATMOSPHERE (RASSEYANIE I POGLOSHCHENIE SEVETA V ATMOSFERE),
G. Sh. Livshits, Z. V. Karyagina, D. A. Rozhkovskii, and T. B. Omarov. 4 Dec 73, 207p Rept no. FSTC-HT-23-1283-73
Trans. from Akademiya Nauk Kazakhskoi SSR, Alma Ata. Astrofizicheskii Institut. Trudy, v18 1971.

Descriptors: *Light scattering, *Atmospheres, Absorption, Aerosols, Day, Brightness, Polarization, Ultraviolet radiation, Light transmission, Translations, USSR.
Identifiers: Atmospheric attenuation.

The book presents a detailed survey of light scattering studies of the daytime sky, the results of brightness and polarization measurements of the sky and observations of the horizontal transparency of the atmosphere. The problem of determining the albedo of localities from measurements of the air field of the descending radiation is studied and the apparatus for the measurement of the brightness and polarization of the sky in the ultraviolet region of the spectrum is described. A great deal of attention is given to the study of atmospheric aerosols, in particular, to an investigation of the pure light absorption in aerosols and the spectrum of the large fraction of the particles.

AD-781 039/3GA PC$3.25/MF$1.45
Air Force Cambridge Research Labs L G Hanscom Field Mass
MUTUAL COHERENCE FUNCTION AND FREQUENCY SPECTRUM OF A LASER BEAM PROPAGATING THROUGH ATMOSPHERIC TURBULENCE.
Physical sciences research papers,
Ronald L. Fante. 6 Feb 74, 38p Rept nos. AFCRL-PSRP-585, AFCRL-TR-74-0079

Descriptors: *Laser beams, *Atmospheric motion, Turbulence, Coherence, Functions(Mathematics), Frequency, Spectra, Refractive index.
Identifiers: Mutual coherence functions, Atmospheric attenuation.

The mutual coherence function of a laser beam propagating in turbulence with a modified von Karman spectrum for the index of refraction fluctuations, including a parametric study of the effect on the MCF of varying beam size, focal length, and the properties of the turbulence was computed. The results are valid over all propagation distances, unlike calculations employing the method of smooth perturbations. Also studied was the effect of a constant wind on the frequency spectrum of signal. It was found that over most practical path lengths the spectral width is delta omega = 4.1V ((k sub o)sup 6/5)(z sup 3/5)((C sub n,sub 2)sup 3/5), where V is the wind speed, k sub o is the signal wavenumber, C sub n sup 2 is the strength of turbulence, and z is the path length in the turbulence. (Modified author abstract)

AD-781 057/5GA Not available NTIS
National Research Council of Canada Ottawa (Ontario) Div of Physics
OPTICAL INTERFERENCE COATINGS FOR INHIBITING OF COUNTERFEITING,
J. A. Dobrowolski, K. M. Baird, P. D. Carman, and A. Waldorf. 4 May 73, 14p NRC-13616
Summaries in French and German.
Availability: Pub. in Optica Acta, v20 n12 p925-937 1973.

Descriptors: *Optical coatings, *Thin films, *Protective coatings, Reflectance, Spectrum analysis, Documents, Money.
Identifiers: Counterfeiting, Authentication.

Counterfeiting of valuable papers and identification documents made of paper or plastics, such as banknotes, credit cards, passports, etc., is presently inhibited through the use of inks of many colours, intricate engraved designs on special papers which sometimes contain watermarks or

embedded coloured paper platelets or metal threads. These methods have not always offered adequate protection. It is proposed to use optical multilayer coatings to validate such documents. One property of such coatings is that their spectral characteristics vary with the angle of incidence of the light. This angular variation can be made use of to enable the man in the street to distinguish at a glance an authentic document bearing such a coating from even the best counterfeit lacking it. With the same coating it is possible also to provide ever more discriminating tests of the authenticity of the document for the shop or bank, and for the crime laboratory where more sophisticated equipment can be used. The calculated and actual performance of a number of coatings designed for this purpose are described. These include some that permit positive identification not dependent on colour vision. (Modified author abstract)

AD-781 129/2GA PC$3.75/MF$1.45
Aerospace Corp El Segundo Calif
THE FRESNEL DIFFRACTION PATTERN OF A CIRCULAR APERTURE AT LARGE DISTANCES.
Rept for Apr-Nov 73,
M. T. Tavis, and N. C. Chang. 15 Mar 74, 65p Rept no. TR-0074(4010-01)-1 SAMSO-TR-74-139

Descriptors: *Apertures, *Diffraction, Circular, Laser beams, Computer programs.
Identifiers: Diffraction patterns, DIFRAC computer program, Fresnal zone.

A technique for evaluation of the Fresnel diffraction pattern of a circular aperture with obscuration is discussed. The analysis considers Gaussian illumination over the aperture with constant illumination as the limiting case of infinite beam width. A lens correction factor is also applied. Examples of the pattern in the near region and Rayleigh region are given. Examples with lenses with positive and negative focal lengths are also given. All numerical cases considered are for constant illumination. A computer program for the calculation is given in the Appendix. An Addendum comparing these results with the results of another author has been included. (Author)

N74-22109/4GA PC$4.00/MF$1.45
National Aeronautics and Space Administration, Washington, D.C.
HOLOGRAPHIC DIFFRACTION GRATINGS.
J. Cordelle. Sep 73, 9p NASA-TT-F-14752
Tran-Transl. Into English from Atomes (France), V. 24, No. 271, Dec. 1969 p 763-765.

Descriptors: *Gratings (Spectra), *Holography, Electromagnetic radiation, Interferometry, Maxwell equation, Polarization characteristics.

For abstract, see STAR 1213

N74-22127/6GA PC$6.75/MF$1.45
Universitaets-Sternwarte Goettingen (West Germany).
INVESTIGATIONS ON HOLOGRAPHIC DIFFRACTION GRATINGS FOR STELLAR SPECTROSCOPY UNTERSUCHUNGEN UEBER HOLOGRAPHISCHE BEUGUNGSGITTER FUER DIE STERNSPEKTROSKOPIE.
G. Schmahl. Nov 73, 75p BMFT-FB-T-73-16
Subm-Sponsored by Bundesmin. Fuer Forsch. Und Technol.
In German; English Summary.

Descriptors: *Astronomical telescopes, *Gratings (Spectra), *Holographic interferometry, *Stellar spectra, Argon lasers, Astigmatism, Concavity, Equipment specifications, High resolution, Holography, Optical measuring instruments, Photoconductors, Planar structures, Wave diffraction, Wave front reconstruction.

For abstract, see STAR 1213

N74-22170/6GA PC$4.00/MF$1.45
Scripta Technica, Inc., Washington, D.C.
THE HOLOGRAPHIC GRATING OF THE LYMAN BETA EXPERIMENT OF THE D2A POLAR SATELLITE.
J. Desalos, J. Porteneuve, S. Vidal, A. Soufflot, and M. Olivie. Jul 73, 19p NASA-TT-F-14727
Contract NASW-2484
Tran-Transl. Into English from Unknown French Report, p 155-170.

Descriptors: *D-2 satellites, *Gratings (Spectra), *Holography, *Lyman beta radiation, Image correlators, Spectrophotometry.

For abstract, see STAR 1213

N74-22171/4GA PC$6.25/MF$1.45
Kanner (Leo) Associates, Redwood City, Calif.
INVESTIGATION OF HOLOGRAPHIC DIFFRACTION GRATINGS FOR STAR SPECTROSCOPY.
G. Schmahl. Jul 73, 62p NASA-TT-F-14738
Contract NASW-2481
Tran-Transl. Into English of the Book "Untersuchungen ueber Holographische Beugungsgitter fuer die Sternspektroskopie" Gottingen, Universitaetssternwarte, 1972.

Descriptors: *Gratings (Spectra), *Holographic interferometry, *Stellar spectrophotometry, Astronomical telescopes, Reflecting telescopes, Spectrographs, Systems engineering.

For abstract, see STAR 1213

N74-22172/2GA PC$4.00/MF$1.45
Scripta Technica, Inc., Washington, D.C.
ON THE DETERMINATION OF THE FIELD DIFFRACTED BY A HOLOGRAPHIC GRATING.
D. Maystre, and R. Petit. Aug 73, 6p NASA-TT-F-14747
Contract NASW-2484
Tran-Transl. Into English from Opt. Commun. (Netherlands), Vol. 2, No. 7, Dec. 1970 309-311.

Descriptors: *Diffraction, *Gratings (Spectra), *Holography, Numerical analysis, Surface geometry.

For abstract, see STAR 1213

N74-22173/0GA PC$4.00/MF$1.45
National Aeronautics and Space Administration, Washington, D.C.
HOLOGRAPHIC DIFFRACTION GRATINGS AND THEIR APPLICATIONS.
G. Pieuchard, J. Flamand, J. Cordelle, and A. Labeyrie. Sep 73, 6p NASA-TT-F-14748
Tran-Transl. Into English from les Appl. De l'Holographie, Comptes Rend. Symp. Intern. (Besancon), Jul. 1970 4 p.

Descriptors: *Anastigmatism, *Gratings (Spectra), *Holography, Concavity, Optical equipment.

For abstract, see STAR 1213

N74-22174/8GA PC$4.00/MF$1.45
Techtran Corp., Silver Spring, Md.
RECENT PROGRESS IN THE USE OF HOLOGRAPHIC GRATINGS AND SEVERAL OF THEIR APPLICATIONS.
G. Pieuchard, and J. Flamand. Sep 73, 5p NASA-TT-F-14751
Contract NASW-2485
Tran-Transl. Into English from French Report.

Descriptors: *Gratings (Spectra), *Holography, Concavity, Line spectra.

For abstract, see STAR 1213

PATENT-3 803 758 Not available NTIS
Department of the Air Force Washington D C
DUAL HOLOGRAM PLATE HOLDER.
Patent,
Albert G. Havener, and Roger J. Radley, Jr. Filed 21 May 73, patented 9 Apr 74, 11p Rept nos. PAT-APPL-362 153,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Holograms, *Holders, *Patents, Holography, Interferometry.
Identifiers: PAT-CL-350-3-5, *Dual hologram interferometry, *Interferometeric holography.

The patent describes an apparatus for holding and precisely positioning the two holograms used in dual hologram interferometry. Each hologram can be adjusted in position relative to the other and relative to the reference beam with six degrees of freedmon: three translational along three orthogonal axes and three rotational about these axes. Adjustments are accomplished by piezoelectric micrometers having a resolution of 40 angstroms.

PB-232 694/0GA MF$1.45
National Committee for the International Commission for Optics, Washington, D.C.
SPACE OPTICS. PROCEEDINGS OF THE INTERNATIONAL CONGRESS OF THE INTERNATIONAL COMMISSION FOR OPTICS (9TH), HELD AT SANTA MONICA, CALIFORNIA ON OCTOBER 9-13, 1972.
B. J. Thompson, and R. R. Shannon. Apr 74, 833p*
ISBN-O-309-02144-8
Contract NSR-09-012-105
Paper copy available from National Academy of Sciences, Printing and Publishing Office, 2101 Constitution Ave., Washington, D.C. 20418 $27.00.

Descriptors: *Optics, *Aerospace environment, *Space sciences, *Meetings, Optical equipment, Ultraviolet equipment, Infrared equipment, Optical communication, Radiometry, Thin film, Holography.
Identifiers: Image processing.

This is a state-of-the-art report of the important field of space optics through late 1972. It presents 47 of the technical papers prepared by experts in various parts of the field for the Ninth International Congress of the International Commission for Optics. General categories include space systems, ultraviolet instruments, infrared methods, communications and radiometry, thin films, image processing and holography, optical technology, optical methods, and instrumentation.

20G. Particle Accelerators

AD-781 018/7GA Not available NTIS
National Research Council of Canada Ottawa (Ontario) Div of Physics
FAST RETRACE OF PARTICLE ORBITS THROUGH A LARGE INHOMOGENEOUS MAGNETIC FIELD,
R. J. McKee. 8 Jun 73, 7p NRC-13724
Availability: Pub. in Nuclear Instruments and Methods, 114 p321-326 1974.

Descriptors: *Particle trajectories, *Magnetic fields, Interpolation, Transformations(Mathematics), Computer applications, Canada.

A fast method of retracing orbits through a large, inhomogeneous magnetic field has been developed for applications in particle-physics experiments. The momenta of particles are found by simple linear interpolation in a mesh of previously calculated representative orbits. The essential feature of the scheme is to perform a transformation on the set of observables defining the orbit before doing the interpolation. This is done to reduce both interpolation errors and the required number of mesh points. A detailed development of the method is presented for an actual apparatus. For this apparatus particles were retraced in 0.6

ms/orbit using a CDC 6600 computer, and for 100 mesh points interpolation errors were found to be smaller than experimental errors by more than an order of magnitude. (Author)

INS-TS-9 PC$4.00/MF$1.45
Tokyo Univ., Tanashi (Japan). Inst. For Nuclear Study.
SPECIAL MAGNET SETTING TABLE USING TRAPOROULETT MECHANISM AND STEEL BALL RINGS.
T. Fujino. 25 Sep 73, 12p
In Japanese.

Descriptors: (*Polarized targets, *Electromagnets), Ball bearings, Magnet pole pieces, Specifications, Steels.

For abstract, see NSA 30 01, number 01023.

IPPJ-168 PC$4.00/MF$1.45
Nagoya Univ. (Japan). Inst. Of Plasma Physics.
ELECTRON ORBIT IN ERA (ELECTRON RING ACCELERATOR) WITH AN ELECTROSTATIC TYPE INFLECTOR SYSTEM.
H. Toyama, and H. Ishizuka. Jul 73, 9p

Descriptors: (*Electron-ring accelerators, *Beam dynamics), Electric fields, Electrodes, Electron beams, Electrons, Magnetic fields, Orbits.

For abstract, see NSA 30 01, number 01024.

JINR-P9-7833 PC$4.00/MF$1.45
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Nuclear Problems.
TRENDS OF THE DEVELOPMENT OF HIGH-CURRENT CYCLIC ACCELERATORS: MESON FACTORIES.
V. P. Dzhelepov, V. P. Dmitrievskii, and V. V. Lol'ga. 1974, 16p
In Russian.

Descriptors: (*Meson beams, *Beam production), (*Accelerator facilities, Meson beams), Cyclic accelerators.

For abstract, see NSA 30 01, number 01025.

20H. Particle Physics

AD-780 966/8GA PC$3.00/MF$1.45
Franklin Inst Swarthmore Pa Bartol Research Foundation
NUCLEAR STRUCTURE STUDIES USING THE RESONANCE FLUORESCENCE TECHNIQUE.
Final rept. 8 May 69-7 May 74,
Charles P. Swann. 12 Jun 74, 16p AROD-8317.8-P
Grants DA-ARO-D-31-124-73-G101, DA-ARO-D-31-124-72-G112
Sponsored in part by Grant DA-ARO(D)-31-124-G1147.

Descriptors: *Nuclear structure, *Gamma ray scattering, Oxygen, Sodium, Lead, Bismuth, Cobalt, Copper, Magnesium, Proton reactions.
Identifiers: *Resonance fluorescence technique.

This is the final report of work done under these grants. The resonance fluorescence technique was used in these studies with the source of radiation being either gamma rays from the 19F(p,alpha gamma)16O reaction or from electron bremsstrahlung. Properties of levels at about 7 MeV in 16O, 23Na, 207, 208Pb and 209Bi and from 1 - 5 MeV in 59Co, 24Mg, 206,207, 208Pb, 209Bi and 63, 65Cu were deduced from these measurements. Seven papers have been or are to be published and two additional ones are being prepared. (Modified author abstract)

BNL-18747 PC$5.25/MF$1.45
Brookhaven National Lab., Upton, N.Y. (Usa).
PION--NUCLEUS INTERACTION.
C. B. Dover. Mar 74, 43p

Descriptors: Many-body problem, Nuclear structure, Pion reactions, Pion-nucleon interactions, Quantum field theory, Scattering amplitudes.

For abstract, see NSA 30 01, number 01680.

BUP-56 PC$10.25/MF$1.45
Bergen Univ. (Norway). Dept. Of Physics.
ANALYSIS OF K EXP + P INTERACTION BETWEEN 1.2 AND 1.7 GEV/C INCIDENT K EXP + MOMENTUM.
P. Saetre. Oct 73, 143p

Descriptors: (*Kaon-proton interactions, *Final-state interactions), (*N resonances, *Particle production), (*K resonances, Particle production), Angular distribution, Bubble chambers, Cross sections, Decay, Density matrix, Differential cross sections, Elastic scattering, Gev range 01-10, Kaons neutral, Kaons plus, Linear momentum, Matrix elements, Partial waves, Pions minus, Pions plus, Protons.

For abstract, see NSA 30 01, number 01382.

COO-1716-17 PC$5.75/MF$1.45
Purdue Univ., Lafayette, Ind. (Usa). Dept. Of Chemistry.
THERMODYNAMIC STUDIES ON HEAVY ELEMENTS AND STUDIES IN NUCLEAR CHEMISTRY. FINAL REPORT, FEBRUARY--DECEMBER 1973.
J. W. Cobble. Mar 74, 51p
Contract AT(11-1)-1716

Descriptors: (*Nuclear chemistry, *Research programs), (*Heavy ion reactions, Research programs), Actinides, Fission, Indiana, Leading abstract, Nuclear physics.

For abstract, see NSA 30 01, number 01662.

COO-2220-20 PC$5.50/MF$1.45
Institute for Advanced Study, Princeton, N.J. (Usa).
NARROW RESONANCES IN STATISTICAL MECHANICS.
R. F. Dashen, and R. Rajaraman. 1974, 49p
Contract AT(11-1)-2220

Descriptors: (*Resonance particles, *Statistical mechanics), Bound state, Elementary particles, Mathematical operators, Quantum numbers, S matrix, Statistics, Unitarity.

For abstract, see NSA 30 01, number 01390.

COO-2232-B-44 PC$6.00/MF$1.45
Harvard Univ., Cambridge, Mass. (Usa). Lyman Lab. Of Physics; Rockefeller Univ., New York (Usa).
CALCULABILITY AND NATURALNESS IN GAUGE THEORIES.
H. Georgi, and A. Pais. 1973, 58p
Contract AT(11-1)-2232

Descriptors: (*Gauge invariance, *Symmetry breaking), Cabibbo angle, Coupling, Cp invariance, Fermions, Irreducible representations, Isospin, Mass, Mathematical operators, Muons, Neutrinos, O groups, Renormalization, Su-2 groups, U groups.

For abstract, see NSA 30 01, number 01491.

COO-3058-44 PC$4.00/MF$1.45
Rensselaer Polytechnic Inst., Troy, N.Y. (Usa).
LINEAR ACCELERATOR PROJECT. PROGRESS REPORT, OCTOBER 1--DECEMBER 31, 1973.
E. R. Gaerttner. 20p
Contract AT(11-1)-3058

Descriptors: (*Neutron reactions, *Research programs), (*Reactors, Research programs), Cross sections, Leading abstract, New york.

For abstract, see NSA 30 01, number 01557.

COO-3071-67 PC$4.00/MF$1.45
Florida State Univ., Tallahassee (Usa); Pennsylvania Univ., Philadelphia (Usa).
STRUCTURE IN THE MOMENTUM TRANSFER DISTRIBUTION OF PI EXP - + P IMPLIES RHO + N AT 2.3 GEV/C.
S. Hagopian, V. Hagopian, and W. Selove. 1973, 3p

Descriptors: (*Pion-proton interactions, *Cross sections), (*Rho-765 resonances, *Particle production), Gev range 01-10, Linear momentum transfer, Neutrons, Pions minus, Protons.

For abstract, see NSA 30 01, number 01383.

DESY-73-61 PC$5.25/MF$1.45
Deutsches Elektronen-Synchrotron (Desy), Hamburg (F.R. Germany).
INCLUSIVE PHOTOPRODUCTION OF PIONS, KAONS, AND PROTONS AT 6 GEV.
H. Burfeindt, G. Buschhorn, H. Genzel, P. Heide, and U. Koetz. Dec 73, 41p

Descriptors: (*Photon-proton interactions, *Inclusive interactions), (*Pions plus, *Photoproduction), (*Pions minus, Photoproduction), (*Kaons plus, Photoproduction), Cross sections, Gev range 01-10, Kaons minus, Linear momentum transfer, Protons, Regge trajectories, Scale invariance.

For abstract, see NSA 30 01, number 01371.

DESY-74-1 PC$4.25/MF$1.45
Deutsches Elektronen-Synchrotron (Desy), Hamburg (F.R. Germany).
NEW FORM OF VECTOR MESON DOMINANCE AND THE DEPENDENCE ON THE VECTOR MESON MASS SQUARED.
C. Iso, S. Iwai, H. Kanasugi, and Y. Miyata. Jan 74, 24p

Descriptors: (*Pion-nucleon interactions, Vector dominance model), (*Photon-nucleon interactions, Vector dominance model), Mass, Nucleons, Particle production, Photoproduction, Pions, Scattering amplitudes, Vector mesons.

For abstract, see NSA 30 01, number 01454.

HU-TFT-73-25 PC$3.00/MF$1.45
Helsinki Univ. (Finland). Research Inst. For Theoretical Physics.
QUARK QUANTUM NUMBERS IN THE CURRENT FRAGMENTATION REGION.
M. Chaichian, J. Cleymans, and W. S. Lam. 1973, 10p

Descriptors: (*Quarks, *Particle properties), Baryons, Boundary conditions, Correlations, Decay, Mesons, Particle production, Parton model, Phase space, Proton-proton interactions, Quantum numbers, Su-3 groups.

For abstract, see NSA 30 01, number 01391.

HU-TFT-73-26 PC$3.00/MF$1.45
Helsinki Univ. (Finland). Research Inst. For Theoretical Physics.
NEW PHENOMENA IN PI N IMPLIES PI N: SATURATION OF THE MOST STRINGENT ISOSPIN BOUND.
N. A. Toernqvist. Oct 73, 13p

Descriptors: (*Pion-nucleon interactions, *Isospin), Boundary conditions, Energy, Mev range 100-1000, Phase shift, Pions minus, Pions plus, Saturation, Scattering amplitudes, Spin orientation.

For abstract, see NSA 30 01, number 01455.

HU-TFT-73-28 PC$5.75/MF$1.45
Helsinki Univ. (Finland). Research Inst. For Theoretical Physics.
EFFECT OF THE DELTA (1236) IN THE TWO NUCLEON PROBLEM AND IN NEUTRON MATTER.
A. M. Green, and P. Haapakoski. 1973, 52p

Descriptors: (*Delta-1236 resonances, *Nucleon-nucleon interactions), (*Nuclear matter, Delta-1236 resonances), Binding energy, Coupling constants, Many-body problem, Mesons, Pions, S states, Saturation.

For abstract, see NSA 30 01, number 01470.

HU-TFT-73-30 PC$4.00/MF$1.45
Helsinki Univ. (Finland). Research Inst. For Theoretical Physics.
ZEROES OF THE PION FORM FACTOR.
C. Cronstroem. Nov 73, 13p

Descriptors: (*Pions, *Form factors), Energy, Mathematics, Sum rules.

For abstract, see NSA 30 01, number 01447.

HU-TFT-73-31 PC$4.00/MF$1.45
Helsinki Univ. (Finland). Research Inst. For Theoretical Physics.
SPECULATIONS ON QUARK STRUCTURE AND COUPLINGS.
R. Raitio. Nov 73, 7p

Descriptors: (*Quarks, *Coupling), (*N-1780 resonances, *Quark model), (*Meson resonances, Quark model), (*N-1470 resonances, Quark model), Bootstrap model, Current algebra, Electrons, Excitation, Gev range 01-10, Hadrons, Particle structure, Pions.

For abstract, see NSA 30 01, number 01456.

IFVE-STF-73-31 PC$4.25/MF$1.45
Gosudarstvennyj Komitet Po Ispol'Zovaniyu Atomnoj Ehnergii Sssr, Serpukhov. Inst. Fiziki Vysokikh Ehnergij.
CONCERNING ONE EQUATION FOR PHYSICAL SCATTERING AMPLITUDE.
V. I. Savrin, and N. E. Tyurin. 1973, 25p
In Russian.

Descriptors: (*Scattering amplitudes, *Two-body problem), (*Quantum field theory, Scattering amplitudes), Regge trajectories, Relativistic range.

For abstract, see NSA 30 01, number 01497.

IFVE-STF-73-59 PC$4.00/MF$1.45
Gosudarstvennyj Komitet Po Ispol'Zovaniyu Atomnoj Ehnergii Sssr, Serpukhov. Inst. Fiziki Vysokikh Ehnergij.
GROWTH OF TOTAL CROSS SECTIONS AND THE SLOPE OF THE DIFFRACTION CONE.
L. D. Solov'ev. 1973, 6p
In Russian.

Descriptors: (*Kaon-proton interactions, *Total cross sections), (*Proton-proton interactions, Total cross sections), Diffraction models, Kaons plus, Reaction kinetics.

For abstract, see NSA 30 01, number 01457.

IFVE-STF-73-79 PC$4.00/MF$1.45
Gosudarstvennyj Komitet Po Ispol'Zovaniyu Atomnoj Ehnergii Sssr, Serpukhov. Inst. Fiziki Vysokikh Ehnergij.
ANALYTICAL PROPERTIES OF SCATTERING AMPLITUDE IN THE STRONG COUPLING THEORY.
S. V. Semenov, O. D. Timofeevskaya, and N. E. Tyurin. 1973, 12p
In Russian.

Descriptors: (*Scattering amplitudes, *Strong-coupling model), Coupling, Linear momentum transfer, Potential scattering, Quantum field theory, Scalar fields, Yukawa potential.

For abstract, see NSA 30 01, number 01433.

INP-856 PC$4.00/MF$1.45
Institute of Nuclear Physics, Krakow (Poland).
EXPERIMENTAL TESTS OF GOTTFRIED'S MODEL FOR MULTIPLE PRODUCTION OF PARTICLES IN HADRON--NUCLEUS COLLISION.
R. Holynski, S. Krzwozinski, and K. Zalewski. Nov 73, 13p

Descriptors: (*Proton reactions, *Inclusive interactions), Distribution, Gev range 10-100, Gev range 100-1000, Linear momentum, Multiple production.

For abstract, see NSA 30 01, number 01471.

INP-860 PC$4.50/MF$1.45
Institute of Nuclear Physics, Krakow (Poland).
CORRELATIONS IN PARTICLE PRODUCTION IN PION--PROTON INTERACTIONS AT 40 GEV/C.
1973, 28p

Descriptors: (*Pions minus, *Pair production), (*Pions plus, Pair production), Boundary conditions, Correlation functions, Correlations, Distribution, Gev range 10-100, Linear momentum, Particle production, Pion-proton interactions.

For abstract, see NSA 30 01, NUMBER 01386.

INR-1448 PC$4.00/MF$1.45
Institute of Nuclear Research, Warsaw (Poland).
STRUCTURES IN PROTON--PROTON ELASTIC CROSS SECTION AND TWO COMPONENTS OF POMERON.
M. Swiecki, and G. Wilk. 1973, 12p

Descriptors: (*Proton-proton interactions, *Elastic scattering), (*Pomeranchuk particles, *Particle structure), Cross sections, Linear momentum, Linear momentum transfer, Tev range.

For abstract, see NSA 30 01, number 01472.

ITF-73-162-E PC$4.00/MF$1.45
An Ukrainskoj SSR, Kiev. Inst. Teoreticheskoj Fiziki.
TWO-COMPONENT MODEL OF MULTIPLE PRODUCTION AND FEYNMAN GAS ANALOGY.
I. G. Bogatskaya. 1973, 12p

Descriptors: (*Proton-proton interactions, *Multiple production), Correlations, Integrals, Particle models, Particle production, Pions minus, Statistical mechanics.

For abstract, see NSA 30 01, number 01392.

ITF-73-163-E PC$4.00/MF$1.45
An Ukrainskoj SSR, Kiev. Inst. Teoreticheskoj Fiziki.
EFFECT OF P-WAVE PI --N INTERACTION ON THE PION--DEUTERON SCATTERING LENGTH.
V. V. Peresypkin, and N. M. Petrev. 1973, 10p

Descriptors: (*Pion-nucleon interactions, *P waves), (*Pion-deuteron interactions, *Elastic scattering), Faddeev equations, P states, Potential scattering, S states, Scattering lengths, Two-body problem.

For abstract, see NSA 30 01, number 01473.

ITF-73-175-E PC$4.50/MF$1.45
An Ukrainskoj SSR, Kiev. Inst. Teoreticheskoj Fiziki.
DAMA FOR MESON--BARYON SCATTERING.
L. L. Enkovskii, N. A. Kobylinskii, and A. B. Prognimak. 1973, 28p

Descriptors: (*Pion-nucleon interactions, *Scattering amplitudes), (*Meson-baryon interactions, Scattering amplitudes), Boundary conditions, Duality, Mandelstam representation, Regge cuts, Regge trajectories, Threshold energy.

For abstract, see NSA 30 01, number 01458.

JINR-E2-7732 PC$4.00/MF$1.45
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Theoretical Physics.
ISOSPIN BOUNDS ON POLARIZATION AND SPIN ROTATION PARAMETERS.
D. B. Ion. 1974, 20p

Descriptors: (*Pion-nucleon interactions, *Polarization), Boundary conditions, Differential cross sections, Isospin, Pions minus, Pions plus, Rotation, Scattering amplitudes, Spin.

For abstract, see NSA 30 01, number 01459.

JINR-E2-7787 PC$4.25/MF$1.45
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Theoretical Physics.
RELATIVISTIC PSEUDOPROCESSES FOR SINGLE SPINLESS PARTICLE.
W. Garczynski. 1974, 24p

Descriptors: (*Cauchy problem, *Schroedinger equation), Bosons, Electromagnetic fields, Gauge invariance, Integrals, Minkowski space, Relativistic range, Stochastic processes.

For abstract, see NSA 30 01, number 01393.

JINR-E2-7801 PC$4.00/MF$1.45
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of High Energy.
BEST X EXP 0 (958)-MESON SPIN ANALYZER.
R. Lednitski. 1974, 16p

Descriptors: (*Eta-958 resonances, *Decay), Correlations, Spin.

For abstract, see NSA 30 01, number 01448.

JINR-E4-7721 PC$4.00/MF$1.45
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Theoretical Physics.
METHOD FOR THE CALCULATION OF REAL WEINBERG FUNCTIONS USING THE SAXON--WOODS POTENTIAL.
H. Schulz, and V. N. Efimov. 1974, 16p

Descriptors: (*Neutron reactions, *Scattering), K matrix, Lippmann-schwinger equation, S waves, Strength functions, Woods-saxon potential.

For abstract, see NSA 30 01, number 01474.

JINR-E4-7727 PC$4.00/MF$1.45
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Theoretical Physics.
SINGULARITY SUBTRACTION METHOD FOR EXTRACTING SPECTROSCOPIC INFORMATION FROM NUCLEAR REACTION DATA.
I. Borbely. 1974, 12p

Descriptors: (*Deuteron reactions, *Stripping), (*Deuterium, Deuteron reactions), Decay, Deuterons, Differential cross sections, Emission, Errors, Mev range 10-100, Neutrons, Nuclear structure, One-nucleon transfer reactions, Scattering amplitudes, Singularity, Tritons.

For abstract, see NSA 30 01, number 01563.

JINR-P6-7760 PC$4.00/MF$1.45
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Nuclear Problems.
NEW ISOTOPE EXP 161 YB(T/SUB 1/2/) = 4.2 MIN.
J. Adam, G. Beyer, M. Honusek, K. Ya. Gromov, and H. U. Siebert. 1974, 12p
In Russian.

Descriptors: (*Ytterbium 161, *Beta decay), Gamma spectra, Half-life.

For abstract, see NSA 30 01, number 01643.

JU-RR-73-15 PC$4.50/MF$1.45
Jyvaeskylae Univ. (Finland). Dept. Of Physics.
E2/M1 MIXING OF THE TRANSITIONS FROM THE K/SUP PI / = 2 EXP + BANDS IN EXP 190 EXP 192 OS AND EXP 192 PT.
K. Kaneko. Nov 73, 27p

Descriptors: (*Osmium 190, *Energy-level transitions), (*Osmium 192, Energy-level transitions), (*Platinum 192, Energy-level transitions), Angular correlation, Correlation functions, Electron capture decay, Gamma radiation, Gamma spectra, Iridium 190, Gamma cascades, Matrix elements, Mixing ratio, Multipolarity, Multipoles, Nuclear models, Beta decay, Iridium 192.

For abstract, see NSA 30 01, number 01653.

N74-22320/7GA PC$4.00/MF$1.45
Aeronautical Research Labs., Melbourne (Australia).
A METHOD FOR THE ACCURATE DETERMINATION OF THERMAL DIFFUSE SCATTERING OF X-RAYS.
G. R. Towers. Oct 73, 5p ARL/MET-NOTE-91

Descriptors: *Radiation measurement, *Thermal diffusivity, *X ray scattering, Electromagnetic scattering, Phonons, Temperature profiles.

For abstract, see STAR 1213

N74-22334/8GA PC$4.00/MF$1.45
Washington Univ., St. Louis, Mo. Lab. for Space Physics.
TESTING OF MODELS OF VVH PARTICLE SOURCES AND PROPAGATION.
G. E. Blanford, Jr.. 1972, 10p NASA-CR-138158
Contract NGR-26-008-001

Descriptors: *Charge distribution, *Energy spectra, *Heavy nuclei, *Particle interactions, *Primary cosmic rays, Abundance, Nuclear emulsions, Nuclear models, Propagation velocity, Secondary cosmic rays, Theoretical physics.

For abstract, see STAR 1213

N74-22335/5GA PC$4.00/MF$1.45
Washington Univ., St. Louis, Mo. Lab. of Space Physics.
PRIMARY COSMIC RAY PARTICLES WITH Z 35 (VVH PARTICLES).
G. E. Blanford, Jr., M. W. Friedlander, M. Hoppe, J. Klarmann, and R. M. Walker. 1972, 10p NASA-CR-138157
Contract NGR-26-008-001

Descriptors: *Energy spectra, *Heavy nuclei, *Nuclear particles, *Primary cosmic rays, High altitude balloons, Nuclear emulsions, Plastics, Radiation detectors, Secondary cosmic rays.

For abstract, see STAR 1213

N74-22338/9GA PC$4.50/MF$1.45
Laboratoire de Physique Theorique et des Hautes Energies, Orsay (France).
A GAUGE THEORY OF WEAK AND ELECTROMAGNETIC INTERACTIONS WITH SPONTANEOUS PARITY BREAKING.
P. Fayet. Feb 74, 26p LPTHE-74/9

Descriptors: *Electromagnetic interactions, *Gauge invariance, *Parity, Group theory, Matrices (Mathematics), Theoretical physics.

For abstract, see STAR 1213

N74-22339/7GA PC$7.00/MF$1.45
Laboratoire de Physique Theorique et des Hautes Energies, Orsay (France).
A STUDY OF NEUTRINO-PRODUCTION OF NUCLEON ISOBARS IN THE QUARK MODEL.
P. Andreadis, A. Baltas, A. Leyaouanc, L. Oliver, and O. Pene. Jan 74, 76p LPTHE-74/5

Descriptors: *Hadrons, *Mesons, *Neutrinos, *Nuclear isobars, *Nuclear models, *Nucleons, *Quarks, Current algebra, Group theory, Matrices (Mathematics), Momentum transfer, Theoretical physics.

For abstract, see STAR 1213

UCRL-51538 PC$4.00/MF$1.45
California Univ., Livermore (Usa). Lawrence Livermore Lab.
VARIATION OF Z/SUB P/ IN FISSION WITH CHANGES IN EXCITATION ENERGY AND COMPOUND NUCLEUS.
D. R. Nethaway. 6 Feb 74, 25p
Contract W-7405-Eng-48

Descriptors: (*Fission products, *Atomic number), (*Neutron reactions, *Fast fission), Fast neutrons, Fission yield, Least square fit, Mev range 10-100, Thermal fission, Thermal neutrons.

For abstract, see NSA 30 01, number 01682.

WAPD-TM-1132 PC$4.00/MF$1.45
Bettis Atomic Power Lab., Pittsburgh, PA. (Usa).
THERMAL SCATTERING CROSS SECTIONS OF EXP 233 U AND EXP 232 TH (LWBR DEVELOPMENT PROGRAM).
L. Green, and J. A. Mitchell. Mar 74, 15p
Contract AT-11-1-GEN-14

Descriptors: (*Uranium 233, Neutron reactions), (*Thorium 232, Neutron reactions), (*Neutron reactions, *Elastic scattering), Cross sections, Thermal neutrons.

For abstract, see NSA 30 01, number 01668.

20I. Plasma Physics

AD-780 846/2GA PC$4.00/MF$1.45
Harry Diamond Labs Washington D C
EFFECT OF THERMAL BOUNDARY LAYER ON RF MEASUREMENT OF PLASMA PARAMETERS.
Abraham Singer, and Jan M. Minkowski. Jan 74, 14p Rept no. HDL-TR-1658

Descriptors: *Plasmas(Physics), *Microwaves, Electron energy, Electron density, Shock waves.
Identifiers: Argon plasma, *Plasma diagnostics.

A fundamental limitation in microwave measurement of plasma parameters is established: It is shown that it is not possible to determine experimentally such plasma parameters as electron temperature, electron density, or collision frequency by means of a microwave system operating at a frequency well below the plasma frequency because the plasma boundary layer exerts a prominent effect on the measurements. A numerical example is given, using published results for argon. (Author)

AD-781 038/5GA PC$3.00/MF$1.45
Air Force Cambridge Research Labs L G Hanscom Field Mass
DESIGN AND CONSTRUCTION OF TORMAC IV, A TOROIDAL, BI-CUSP PLASMA CONTAINMENT DEVICE.
Physical sciences research papers,
Charles C. Gallagher, and Morton A. Levine. 6 Mar 74, 25p Rept nos. AFCRL-PSRP-590, AFCRL-TR-74-0122

Descriptors: *Plasma devices, *Plasmas(Physics), *Containment(General), Toroids, Magnetic fields, Heating, Magnetic coils, Winding.
Identifiers: *Tormac 4 plasma device, Design.

Tormac 4 features the production, containment, and heating of plasma within a 48 cm O.D. toroidal chamber. The plasma has a predicted shield-shaped cross section, an included toroidal magnetic field component, and is contained by a two-pole cusp magnetic fluid comprised of both toroidal and poloidal components. The principal plasma heating is provided by an additional magnetic field component at 0.7 MHz. An electrolytic, analog tank facilitates the coil design and indicates that 18 kJ is sufficient to produce a uniform 6 kG on the plasma surface. An integral winding system for the poloidal and toroidal field coils minimizes coupling problems and simplifies insulation requirements. Single turn coils for preionization and heating are applied external to the poloidal-toroidal windings, and the whole device is reinforced with PVC plates and steel tie rods. (Modified author abstract)

AD-781 044/3GA PC$3.75/MF$1.45
Air Force Weapons Lab Kirtland AFB N Mex
MAGPIE: A USER'S MANUAL.
Final rept. Dec 73-Apr 74,
H. S. Stockman, Jr. Jun 74, 55p Rept no. AFWL-TR-74-120

Descriptors: *Magnetohydrodynamics, *Computer programs, Exploding wires, Equations of state, Plasmas(Physics), Instruction manuals, Computerized simulation.
Identifiers: MAGPIE computer code, CDC 6600 computers.

A user's guide for MAGPIE, a one-dimensional Lagrangian magnetohydrodynamics (MHD) computer code, has been prepared. MAGPIE is suitable for cylindrical geometries of conducting and insulating materials, whose equations of state are either provided by the code or the user. Although time-dependent boundary conditions can be employed by the user, MAGPIE is capable of solving an external series circuit. As an example, an exploding wire problem has been run with MAGPIE. The resulting velocities and current features agree qualitatively with experimental findings. (Author)

AD-781 064/1GA PC$3.25/MF$1.45
Arnold Engineering Development Center Arnold Air Force Station Tenn
ELECTRON DENSITY PROFILE MEASUREMENTS.
Final rept. 1 Nov 72-31 May 73,
Joseph A. Sprouse, and J. D. Few. Jun 74, 39p Rept no. AEDC-TR-74-40
Prepared in cooperation with ARO, Inc., Tenn. Rept. no. ARO-ETF-TR-74-17.

Descriptors: *Plasmas(Physics), *Microwaves, *Electron density, Rocket exhaust, Plumes, Electromagnetic interference, Attenuation, Electron energy.
Identifiers: Argon plasma.

Electron density profiles of a low density supersonic argon plasma were obtained using 35-GHz microwave attenuation data and spectral intensity measurements of the 4158- and 6032-A argon emission lines. The integrated profile data from the spectral intensity and microwave attenuation measurements were inverted to local values of the emission coefficient and absorption coefficient, respectively, using an Abel inversion technique. The profile data and results of the inversion are presented. (Author)

AD-781 070/8GA Reprint
New York Univ N Y Courant Inst of Mathematical Sciences

PROPAGATION OF FREQUENCY-MODULATED PULSES IN A RANDOMLY STRATIFIED PLASMA.
Interim rept.,
Ioannis M. Besieris, and Frederick D. Tappert. 8 Aug 72, 6p AFOSR-TR-74-0851
Grant AF-AFOSR-2107-71
Prepared in cooperation with Bell Lab., Whippany, N.J.
Availability: Pub. in Jnl. of Mathematical Physics, v14 n6 p704-707 Jun 73.

Descriptors: *Plasmas(Physics), *Electromagnetic pulses, Frequency modulation, Attenuation, Dispersion relations, Stochastic processes, Boundary value problems.

Quantitative predictions are made of the effects of randomness and dispersion on the spreading, attenuation, and modulation coefficient of a frequency-modulated wave packet propagating in a randomly stratified isotropic plasma. In the absence of random fluctuations, the recently reported findings of Millman and Bell are recovered. (Author)

AD-781 127/6GA PC$3.75/MF$1.45
United Aircraft Research Labs East Hartford Conn
RESEARCH ON PLASMA PRODUCED BY LASER-SOLID INTERACTION AND LASER PRODUCED PLASMA FOR THERMONUCLEAR REACTORS.
Final rept. 1 Apr 67-31 Mar 74,
James T. Woo, Walter J. Fader, Donald H. Polk, and Alan F. Haught. 31 May 74, 64p Rept no. UARL-N950556-1 AFOSR-TR-74-0961
Contract F44620-67-C-0082

Descriptors: Plasmas(Physics), *Laser beams, Magnetic mirrors, Gas ionization, Recombination reactions, Nuclear fusion, Electron density, Curve fitting.
Identifiers: *Laser produced plasmas.

The properties of hot, dense plasmas produced by laser irradiation of an isolated solid particle suspended in vacuum have been investigated and studies made of the use of such plasmas confined within a mirror magnetic field as the target for an energetic neutral beam to form a steady state fusion plasma. Theoretical analysis of the mechanism of plasma production and the role of local ionization and recombination on the properties of the afterglow plasma were performed and found to be in excellent agreement with experimental measurements of the time history of the plasma properties obtained from charge collectors, mass spectrometer and line radiation diagnostics. Survey calculations were used to develop empirical formulas relating the irradiating laser characteristics to the properties of the resulting plasma over a wide range of initial particle size and laser heating conditions. (Modified author abstract)

AD-781 137/5GA PC$3.25/MF$1.45
Innsbruck Univ (Austria) Inst for Theoretical Physics
PLASMA ENGINEERING: INSTABILITIES, PARTIAL DELIVERY NR. 1 OF THE ENGINEERS HANDBOOK ON PLASMA INSTABILITIES.
Scientific rept.,
Ferdinand F. Cap. Mar 74, 38p AFOSR-TR-74-0717
Contract F44620-72-C-0016

Descriptors: *Plasmas(Physics), *Nuclear fusion, Instability, Engineering, Handbooks, Magnetohydrodynamics, Plasma devices, Austria.
Identifiers: *Plasma instabilities.

The report is the first part of an Engineer's Handbook on plasma instabilities and their use, control, stabilization and engineering application. The book will be necessary for design and feasibility studies of thermonuclear fusion and other plasma engineering devices. The first delivery describes the many useful technological applications of plasma and fusion devices, as well as the aim, purpose and scope of the book. (Modified author abstract)

AD-781 157/3GA PC$4.00/MF$1.45
Army Foreign Science and Technology Center Charlottesville Va
DEVELOPMENT OF AN ELECTRICAL DISCHARGE IN GAPS WITH GREAT OVERVOLTAGE AT LOW AIR PRESSURE (RAZVITIE ELEKTRICHESKOGO RAZRYADA V SILNO PERENAPRYAZHENNYKH PRI NIZKOM DAVLENII VOZDUKHA),
Yu. I. Bychkov, V. V. Osipov, Yu. A. Kurbatov, and A. G. Filonov. 8 Aug 73, 8p Rept no. FSTC-HT-23-1841-73
Trans. of Izvestiya Vysshikh Uchebnykh Zavedenii. Fizika (USSR) n1(128) p61 1973, by Albert L. Peabody.

Descriptors: *Electric discharges, Glow discharges, Gas discharges, Pulse generators, Low pressure, Translations, USSR.

The physical processes responsible for breakdown of gas gaps with overvoltages of a few percent have been studied in a number of works both oscillographically and optically. Theoretical calculations have shown that known experimental facts are explained well by the theory of Townsend avalanche generation. In the present work, the authors studied the development of a discharge in gaps of 1-6 cm with overvoltages of 2-20 times, and also measured the time characteristics, both the discharge delay time (t sub d), the time of switching to the 0.5 (U sub 0) level and the duration of the 'step' as functions of the electric field voltage.

AD-781 159/9GA PC$4.25/MF$1.45
Army Foreign Science and Technology Center Charlottesville Va
GAS ELECTRONICS,
G. V. Spivak. 1 Apr 74, 22p Rept no. FSTC-HT-23-570-73
Trans. from Razvitii Fiziki v Rossil (USSR) v2 1970.

Descriptors: *Gas discharges, Plasmas(Physics), Magnetic fields, Plasma oscillations, Translations, USSR.
Identifiers: Plasma diagnostics.

A brief historical survey is given of work which was performed in the Soviet Union in the field of the physics of the gas discharge, with respect to the elementary processes originating in the passage of an electrical current through gases, and related problems. Early work in the investigation of the discharge is enumerated, with respect to the establishment of gas conductivity. Investigations which laid the foundation of the development of theoretical concepts of plasma are described, and also work performed in recent years. Works are considered which are devoted to the behavior of plasma in a magnetic field, plasma diagnostics, and various types of discharges. (Modified author abstract)

N74-22352/0GA PC$4.00/MF$1.45
Scientific Translation Service, Santa Barbara, Calif.
MEASUREMENT OF TURBULENT HF FIELDS IN A HIGH CURRENT RECTILINEAR GAS DISCHARGE FROM THE INTENSITY OF FORBIDDEN HEI LINES.
G. V. Zelenin, A. A. Kutsyn, M. Y. Maznichenko, O. S. Pavlichenko, and V. A. Suprunenko. Apr 74, 9p NASA-TT-F-15524
Contract NASW-2483
Tran-Transl. Into English from Fiz. Plaz. Probl. Upr. Termoyad. Sin. Dokl. Konf. (Kharkov), No. 4, 1973 p 203-208.

Descriptors: *Gas discharges, *Line spectra, *Plasma heating, *Plasma turbulence, Emission spectra, Helium, High frequencies.

For abstract, see STAR 1213

N74-22353/8GA PC$4.00/MF$1.45
Kanner (Leo) Associates, Redwood City, Calif.
INVESTIGATION OF A PENNING DISCHARGE AT LOW PRESSURE.
B. G. Safronov, and V. G. Konovalov. Apr 74, 16p NASA-TT-F-15523
Contract NASW-2481
Tran-Transl. Into English from Fiz. Plazmy Probl. Upr. Termoyad. Sin. (Kiev), No. 4, 1973 p 27-37.

Descriptors: *Low pressure, *Penning discharge, Cathodes, Diamagnetism, Magnetic fields.

For abstract, see STAR 1213

N74-22354/6GA PC$4.00/MF$1.45
Iowa Univ., Iowa City. Dept. of Physics and Astronomy.
THERMAL RELAXATION OF A TWO DIMENSIONAL PLASMA IN A DC MAGNETIC FIELD. PART 1: THEORY.
H. Jang-yu, D. Montgomery, and G. Joyce. Jan 74, 15p NASA-CR-138170, U-OF-IOWA-74-1-PT-1
Contracts NGL-16-001-043, AT(11-1)-2059

Descriptors: *Magnetic fields, *Plasmas (Physics), *Relaxation time, *Temperature effects, Debye length, Direct current, Kinetic equations.

For abstract, see STAR 1213

N74-22355/3GA PC$6.75/MF$1.45
California Univ., San Diego.
BEHAVIOR OF THERMAL PLASMA IN THE IONOSPHERE AND MAGNETOSPHERE.
Final Technical Report.
P. M. Banks, and J. R. Doupnik. 13 Nov 73, 74p NASA-CR-138115
Contract NGR-05-009-180

Descriptors: *Electron density (Concentration), *Ionosphere, *Thermal plasmas, Atmospheric models, Computer programs, Display devices, Ions, Magnetosphere, Polar regions, Wind velocity.

For abstract, see STAR 1213

N74-22366/0GA PC$6.00/MF$1.45
Royal Inst. of Tech., Stockholm (Sweden). Dept. of Plasma Physics and Fusion Research.
PLASMA CONFINEMENT IN PRESENCE OF MAGNETICALLY SHIELDED SUPPORTS.
B. Lehnert. Dec 73, 60p REPT-73-19

Descriptors: *Magnetic shielding, *Plasma control, *Toroidal plasmas, Adiabatic conditions, Magnetic field configurations, Magnetically trapped particles, Magnetohydrodynamic stability, Plasma loss, Plasma physics.

For abstract, see STAR 1213

N74-22367/8GA PC$4.00/MF$1.45
Royal Inst. of Tech., Stockholm (Sweden). Dept. of Plasma Physics and Fusion Research.
ON PLASMA HEATING IN INTERNAL RING SYSTEMS WITH SHIELDED SUPPORTS.
B. Lehnert. 10 Jan 74, 13p TRITA-EPP-74-01

Descriptors: *Magnetic shielding, *Plasma control, *Plasma heating, *Toroidal plasmas, Electric current, Lines of force, Magnetic fields, Plasma physics, Supports.

For abstract, see STAR 1213

20J. Quantum Theory

AD-780 874/4GA Reprint
Air Force Cambridge Research Labs L G Hanscom Field Mass
TIME-DEPENDENT PROJECTION-OPERATOR APPROACH TO MASTER EQUATIONS FOR COUPLED SYSTEMS,
C. R. Willis, and R. H. Picard. 27 Nov 73, 16p Rept no. AFCRL-TR-74-0255
Revision of report dated 27 Feb 73.
Availability: Pub. in Physical Review A, v9 n3 p1343-1358 Mar 74.

Descriptors: *Quantum theory, *Kinetic theory, Operators(Mathematics), Coupling(Interaction), Hamiltonian, Approximation, Optics.

In the paper the authors derive master equations for two or more systems coupled to each other, perhaps strongly, by using a generalization of the usual projection-operator technique to include time-dependent projection operators. The coupled systems may be either similar or dissimilar and classical or quantum mechanical. (Modified author abstract)

AD-780 991/6GA Reprint
Emmanuel Coll Boston Mass Physics Research Div
TRIDENTS PRODUCED BY 1-4-GEV POSITRONS,
Y. K. Lim, K. Fukui, and P. S. Young. 28 Sep 73, 7p AFCRL-TR-74-0212
Contract F19628-71-C-0060
Availability: Pub. in Physical Review D, v9 n3 p575-580, 1 Feb 74.

Descriptors: *Positrons, Quantum theory, Electrodynamics, Electron energy.
Identifiers: *Electron pairs, *Trident production.

The mean free paths for trident production in nuclear emulsions by positrons of mean energies 0.84, 1.71, and 3.42 GeV have been determined to b 103 plus or minus 25, 73 plus or minus 16, and 44 plus or minus 9 cm, respectively. Two methods of background corrections have been used. The values are found to be consistent with the theoretical total cross sections predicted by quantum electrodynamics. (Author)

AD-781 069/0GA PC$4.75/MF$1.45
National Research Council Washington D C
CONTINUED FRACTION METHODS FOR DEGENERATE PERTURBATION THEORY.
Technical rept. Jan-Jul 72,
D. F. Scofield. Mar 74, 131p ARL-74-0024
Contract F18600-73-C-0066

Descriptors: *Perturbation theory, *Continued fractions, *Quantum theory, Banach space, Schrodinger equation, Theorems.
Identifiers: Newtons method, Rayleigh-Schrodinger perturbation theory, Brillouin-Wigner perturbation theory.

The operator which gives the level shift from the unperturbed to the perturbed system is shown to satisfy a quadratic equation in a Banach space. This quadratic equation is solved using a continued fraction approach and using Newton's method. The asymptotic expansion of the solution using the continued fraction method is shown to be equivalent to the Rayleigh-Schrodinger perturbation expansion. The theory is developed so as to be applicable to the degenerate perturbation problem. Several extensive numerical calculations are reported which show the superiority of the method compared to Rayleigh-Schrodinger perturbation theory, Feenberg perturbation theory and Brillouin-Wigner perturbation theory. (Author)

AD-781 078/1GA PC$13.50/MF$1.45
Temple Univ Philadelphia Pa Dept of Physics
RENORMALIZATION GROUP IN CRITICAL PHENOMENA AND QUANTUM FIELD THEORY: PROCEEDINGS OF A CONFERENCE. HELD AT CHESTNUT HILL, PA. ON 29-31 MAY 73.
Final rept. Apr-Oct 73,
J. D. Gunton, and M. S. Green. 1974, 208p
AFOSR-TR-74-0990
Grants AF-AFOSR-2530-73, Nonr(G)-00012-73

Descriptors: *Quantum theory, *Meetings, Groups(Mathematics), Interactions, Conformal mapping, Invariance, Field theory, Equations of state, Abstracts.
Identifiers: *Renormalization theory, Eigenvalues, Feynman diagrams, *Quantum field theory.

Because the origin of the renormalization group is in quantum field theory and more importantly because applications of the theory in phase transitions have reflected back into quantum field theory it was decided that the conference should cover the renormalization group in critical phenomena and quantum field theory. The conference took place at the Temple University Conference Center at Sugarloaf, Chestnut Hill, Pa on May 29, 30 and 31, 1973. The present publication is the Proceedings of the Conference. (Author)

AD-781 119/3GA Reprint
Rockefeller Univ New York Dept of Physics
THE DISCRETE INVERSE SCATTERING PROBLEM IN ONE DIMENSION,
K. M. Case. 18 Jun 73, 6p AFOSR-TR-74-0858
Grant AF-AFOSR-2187-72
Availability: Pub. in Jnl. of Mathematical Physics, v15 n2 p143-146 Feb 74.

Descriptors: *Quantum theory, Matrices(Mathematics), Schrodinger equation.
Identifiers: *Inverse scattering.

A discrete version of the inverse scattering problem in one dimension is considered. While the natural formulation is somewhat different from the three-dimensional problem with spherical symmetry, the equations of solution turn out to be almost identical. Indeed, in the continuous limit (Schrodinger equation) even the slight differences disappear. Two equivalent treatments corresponding to considering incidence from left to right are given. For actual computation a combination of the two seems most efficient. (Author)

JINR-P2-7708 PC$4.00/MF$1.45
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Theoretical Physics.
QUANTUM STATISTICS OF MASSLESS SCALAR PARTICLES IN THE FRIEDMANN WORLD.
E. N. Chernikova. 1974, 12p
In Russian.

Descriptors: (*General relativity theory, *Statistics), Geometry, Particles, Quantum field theory, Scalars, Spherical configuration, Universe.

For abstract, see NSA 30 01, number 01807.

LA-5519-MS PC$4.00/MF$1.45
Los Alamos Scientific Lab., N.Mex. (Usa).
FUNCTIONALS ADDITIVE ON A SYMMETRIC SET.
E. D. Cashwell, and C. J. Everett. Mar 74, 4p
Contract W-4705-eng-36

Descriptors: Collisions, Elastic scattering, Group theory, Hilbert space.

For abstract, see NSA 30 01, number 02241.

N74-22341/3GA PC$4.75/MF$1.45
Scientific Translation Service, Santa Barbara, Calif.
THEORY OF RADIATION GENERATED BY CHARGED PARTICLES PASSING THROUGH CONTINUOUS PERIODIC MEDIUM.
G. M. Garibian, and Y. Chi. Jul 73, 31p NASA-TT-F-14726, YEFM-16(73)
Contract NASW-2483
Tran-Transl. Into English of "Teoriya Izlucheniya Voznikayushchego Pri Prokhodzhenii Zaryazhennoy Chastitsy Cherez Nepreryvnyyu Periodicheskuyu Sredu," Yerevan Physics Inst., Yefm-16(73), 1973 33 p.

Descriptors: *Charged particles, *Perturbation theory, *Radiation, *Theoretical physics, Bragg angle, Density (Mass/volume), Hill method, Panels, Sandwich structures, Vacuum.

For abstract, see STAR 1213

20K. Solid Mechanics

AD-780 559/1GA PC$4.00/MF$1.45
Naval Intelligence Support Center Washington D C Translation Div
DETERMINATION OF STRESSES IN A CYLINDRICAL SHELL WITH AN ELLIPTIC APERTURE (KOPREDELENIYU NAPRYAZHENII V TSILINDRICHESKOI OBOLOCHKE S ELLIPTICHESKIM OTVERSTIEM),
S. V. Zakora, V. N. Chekhov, and Yu. A. Shevlyakov. 11 Feb 74, 9p Rept no. NISC-Trans-3513
Trans. of Nikolaev Shipbuilding Institute. Trudy (USSR) n56 p22-26 1972.

Descriptors: *Stresses, *Shells(Structural forms), Cylindrical bodies, Partial differential equations, Computations, Translations, USSR, Elipses.
Identifiers: *Cylindrical shells.

The distribution of stresses at a large elliptic aperture located on the lateral surface of a circular cylindrical shell was studied in previous papers where it is assumed that the shape of the aperture differs only little from the circle on the evolute of a cylinder. To eliminate this restriction, an alternative method of numerical determination of stresses in a shell with curvilinear aperture was proposed in yet another paper. In the present paper, this method is applied to the case of an elliptical aperture.

AD-780 634/2GA PC$7.25/MF$1.45
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Engineering
APPROXIMATE SOLUTIONS FOR THE FUNDAMENTAL FREQUENCY OF SQUARE PLATES WITH VARIABLE THICKNESS.
Master's thesis,
Faust H. Wertz. Mar 74, 81p Rept no. GAW/MC/74-20

Descriptors: *Plates, *Vibration, Resonant frequency, Perturbation theory, Deflection, Elastic properties, Modulus of elasticity, Theses.

A perturbation method was used to approximate the fundamental frequency and mode shape of variable thickness, square, simply supported plates. The study was divided into two major phases; development of the necessary equations from perturbation theory and application of the equations to specific examples. The perturbation equations developed were found to be quite general, since the frequency of a plate of any thickness shape could be evaluated without reformulation of the equations in a different form. The only requirement necessary to use the equations is that the thickness of the plate be representable as a continuous function with continuous first derivatives. (Modified author abstract)

AD-780 829/8GA PC$4.50/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio

STRUCTURAL STABILITY (CHAPTER 1 AND INTRODUCTION),
Ya. G. Panovko. 3 May 74, 112p Rept no. FTD-HC-23i997-74
Edited trans. of Prochnost i Ustoichivost-Kolebaniya (USSR) v3 p1-90 1968.

Descriptors: *Structural members, *Buckling, Loads(Forces), Stability, Plates, Shells(Structural forms), Beams(Structural), Translations, USSR.

The report considers the stability of bars, particularly elastic bars on rigid supports.

AD-780 972/6GA PC$3.25/MF$1.45
Cold Regions Research and Engineering Lab Hanover N H
ANALYSIS OF THE BUCKLING PRESSURE OF AN ELASTIC PLATE FLOATING ON WATER AND STRESSED UNIFORMLY ALONG THE PERIPHERY OF AN INTERNAL HOLE.
Final rept. 1 Jul 72-31 May 74,
Shunsuke Takagi. Mar 74, 48p AROD-I-466.2-E
See also AD-750 594.

Descriptors: *Plates, *Panels, *Holes(Openings), *Buckling, Elastic properties, Floating bodies, Stresses, Loads(Forces), Deformation, Numerical integration, Green's function.

The problem reduces to an eigenvalue problem of a fourth-order ordinary differential equation in a semi-infinite region. Two methods of solution, the Green function method and the contour integral method, are presented. The Green function method yields an integral equation that can be solved only numerically. The contour integral method gives a third-order ordinary differential equation of which the singular points are all regular. Therefore a series solution relative to a singular point can be analytically continued to a linear combination of a set of series solutions relative to another singular point. In this way we find the integrand, required in the contour integral method, that vanishes at x = infinity and has a branch point at the lower end of the integration. The contour integral thus formulated is reduced to a linear combination of the fundamental solutions, relative to x = 0, of the original fourth-order differential equation. This linear combination can give the solutions to our eigenvalue problem. (Author)

AD-781 072/4GA Reprint
New York Univ N Y Courant Inst of Mathematical Sciences
WAVE PROPAGATION IN ELASTIC RODS OF ARBITRARY CROSS SECTION.
Interim rept.,
Gerald Rosenfeld, and Joseph B. Keller. 20 Apr 73, 9p AFOSR-TR-74-0904
Grant AF-AFOSR-2107-71
Availability: Pub. in Jnl. of the Acoustical Society of America, v55 n3 p555-561 Mar 74.

Descriptors: *Rods, *Elastic waves, Boundary value problems, Numerical analysis.

Asymptotic expansions are found for both long and short waves propagating in elastic rods of arbitrary cross section. The results are compared with the well known approximate theories for long waves and show to what extent those theories are accurate. They also yield corrections to them. (Author)

AD-781 074/0GA Reprint
New York Univ N Y Courant Inst of Mathematical Sciences
ON THE COLLAPSE OF SHALLOW ELASTIC MEMBRANES.
Interim rept.,
Louis Bauer, Andrew J. Callegari, and Edward L. Reiss. 1973, 32p AFOSR-TR-74-0927
Grants AF-AFOSR-2107-71, NSF-GP-27223
Sponsored in part by Contract AT(11-1)-3077.
Availability: Pub. in Nonlinear Elasticity, p1-30 1973.

Descriptors: *Shells(Structural forms), *Buckling, Elastic properties, Graphics, Numerical analysis.

The von Karman and Tsien conjecture concerning the snap through buckling of a shallow axisymmetric shell is studied by use of membrane theory of shallow shells. Numerical solutions and analytic arguments are presented to show that the response diagram (pressure vs. deflection curve) is in general more complicated tha conjectured by von Karman and Tsien. (Author)

AD-781 115/1GA Reprint
Technion - Israel Inst of Tech Haifa
BUCKLING ANALYSIS OF HYDROSTATICALLY LOADED CONICAL SHELLS BY THE COLLOCATION METHOD,
A. Shalev, M. Baruch, and E. Nissim. 26 Jul 73, 7p AFOSR-TR-74-0826
Contract F44620-71-C-0116, Grant AF-AFOSR-2394-72
Presented at the AIAA/ASME/SAE Structures, Structural Dynamics and Materials Conference (14th) Held at Williamsburg, Va., 20-22 Mar 73, Paper 73-364. Revision of report dated 29 Mar 73.
Availability: Pub. in AIAA Jnl., v11 n12 p1603-1607 Dec 73.

Descriptors: *Shells(Structural forms), *Buckling, Hydrostatic pressure, Loads(Forces), Numerical analysis, Israel.
Identifiers: *Collocation method.

A collocation method is proposed as an alternative to the conventional methods of solving buckling problems. The method is applied to hitherto unsolved buckling problems. Those are elastically supported conical shells of given geometry subjected to hydrostatic pressure. Five possible elastic supports are assumed and the variations of the critical load due to change of the supports' stiffnesses are determined. The suitability of the collocation method for buckling problems analysis is displayed in its ability to satisfy complicated boundary conditions and range differential equations with continuous derivatives. (Author)

AD-781 145/8GA PC$4.75/MF$1.45
Technion - Israel Inst of Tech Haifa Dept of Aeronautical Engineering
FURTHER STUDIES ON THE EFFECT OF IN-PLANE BOUNDARY CONDITIONS ON THE BUCKLING OF STIFFENED CYLINDRICAL SHELLS.
Interim rept.,
Tanchum Weller. Jan 74, 148p Rept no. TAE-120 AFOSR-TR-74-0965
Contract F61052-69-C-0040, Grant AF-AFOSR-2394-72
Sponsored in part by Contract F44620-71-C-0116.

Descriptors: *Stiffened cylinders, *Shells(Structural forms), *Buckling, Cylindrical bodies, Loads(Forces), Hydrostatic pressure, Stability, Israel.
Identifiers: *Stiffened cylinders, *Cylindrical shells.

The effects of in-plane boundary conditions on the buckling loads of simply supported shells, stiffened by rings and stringers is studied. The effects differ appreciably from those in isotropic or ring stiffened shells and are considerably dependent upon stiffener geometry and location. The axial restraint, u = O, is the predominant factor and the 'weak in shear', N sub x phi = O, boundary conditions have only a minor influence. The critical loads corresponding to the SS2 and SS4 boundary conditions are appreciably raised compared to the ones obtained for the 'classical' boundary conditions and the effect is more emphasized for internal stringers. The loads corresponding to the SS1 conditions are almost identical with the 'classical' critical loads. (Modified author abstract)

AD-781 158/1GA PC$4.00/MF$1.45
Army Foreign Science and Technology Center Charlottesville Va
PROPAGATION OF SHORT WAVES IN A CYLINDRICAL SHELL,
E. B. Ometsinskaya. 21 Feb 74, 10p Rept no. FSTC-HT-23-404-72
Trans. from Prikladnaya Mekhanika (USSR) v6 n10 1970.

Descriptors: *Shells(Structural forms), *Elastic waves, Partial differential equations, Translations, USSR.
Identifiers: *Cylindrical shells.

The paper discusses research on the applicability of nonclassical equations of the dynamics of a cylindrical shell, obtained by use of the exponential series method, to the study of short-wave processes in a shell. Shell theory equations are given. (Author)

N74-22528/5GA PC$13.75/MF$1.45
General Dynamics/Convair, San Diego, Calif.
CONICAL ISOGRID ADAPTER STRUCTURAL TEST RESULTS.
J. E. Dyer, and P. Slysh. Feb 74, 211p NASA-CR-120205, PD-73-0123
Contract NAS8-29859

Descriptors: *Composite structures, *Grids, *Spacecraft structures, *Structural analysis, Bending moments, Compression loads, Conical bodies, Structural stability.

For abstract, see STAR 1213

N74-22531/9GA PC$7.00/MF$1.45
Youngstown State Univ., Ohio.
APPLICATION OF ULTRASONIC SIGNATURE ANALYSIS FOR FATIGUE DETECTION IN COMPLEX STRUCTURES.
Final Report, 1 Sep. 1972 - 30 Nov. 1973.
A. J. Zuckerwar. 28 Feb 74, 80p NASA-CR-138113
Contract NGR-36-028-006

Descriptors: *Fatigue (Materials), *Nondestructive tests, *Signature analysis, *Ultrasonic tests, Aircraft structures, Analog to digital converters, Crack propagation.

For abstract, see STAR 1213

N74-22532/7GA PC$19.50/MF$1.45
California Inst. of Tech., Pasadena. Graduate Aeronautical Labs.
FAILURE CRITERIA FOR VISCOELASTIC MATERIALS.
Final Report.
W. G. Knauss. Jan 74, 328p NASA-CR-138125, GALCIT-120
Contract NGL-05-002-005

Descriptors: *Failure analysis, *Fracture mechanics, *Materials tests, *Viscoelasticity, Composite materials, Elastic properties, Elastomers, Mechanical properties.

For abstract, see STAR 1213

N74-22534/3GA PC$3.25/MF$1.45
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
FLUTTER OF ELASTICALLY SUPPORTED ORTHOTROPIC PANELS INCLUDING THE EFFECTS OF FLOW ANGLE.
J. W. Sawyer. May 74, 38p NASA-TN-D-7491, L-9312

Descriptors: *Air flow, *Flow distribution, *Flutter analysis, *Orthotropic plates, Damping, Dynamic structural analysis, Elastic properties.

For abstract, see STAR 1213

N74-22535/0GA PC$4.00/MF$1.45
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.

THE EFFECT OF BROKEN STRINGERS ON THE STRESS INTENSITY FACTOR FOR A UNIFORMLY STIFFENED SHEET CONTAINING A CRACK.
C. C. Poe, Jr.. 1973, 13p NASA-TM-X-71947
Conf-Presented at the 10TH Anniv. Meeting of the Soc. Of Eng. Sci., Raleigh, N. C., 5-7 Nov. 1973.

Descriptors: *Cracks, *Rigid structures, *Stress analysis, *Stringers, Aluminum, Crack propagation, Fatigue (Materials), Metal sheets, Stress concentration.

For abstract, see STAR 1213

N74-22536/8GA PC$4.25/MF$1.45
Aeronautical Research Labs., Melbourne (Australia).
ANALYSIS OF AN ORTHOTROPIC PLATE WITH TWO OPPOSITE EDGES SIMPLY SUPPORTED AND THE OTHER TWO FREE.
R. H. Keays. Sep 73, 24p ARL/SM-NOTE-398

Descriptors: *Dynamic structural analysis, *Orthotropic plates, *Stress analysis, Finite element method, Mechanical properties, Numerical analysis.

For abstract, see STAR 1213

N74-22540/0GA PC$9.25/MF$1.45
Israel Inst. of Tech., Haifa. Dept. of Aeronautical Engineering.
FINITE LONGITUDINALLY MULTI-LAYERED MEMBRANE SHELLS SUBJECTED TO IMPACT LOADS.
M. Ziv. Sep 73, 122p TAE-186
In English; Partly in Hebrew.

Descriptors: *Cylindrical shells, *Impact loads, Axial strain, Boundary value problems, Finite difference theory, Particle motion, Shock discontinuity.

For abstract, see STAR 1213

N74-22543/4GA PC$8.50/MF$1.45
Laboratorium fuer Betriebsfestigkeit, Darmstadt (West Germany).
MAIN EFFORTS IN FATIGUE RESEARCH AT THE LABORATORIUM FUER BETRIEBSFESTIGKEITSFORSCHUNG SCHWERPUNKTE DER BETRIEBSFESTIGKEITSFORSCHUNG IM LBF.
O. Buxbaum. 6 Nov 73, 109p LBF-TB-110/73
Conf-Proc. Of 2D Lbf Colloq., Darmstadt, West Ger., 1-2 Nov. 1973.
Language in German.

Descriptors: *Fatigue (Materials), *Research and development, *Stress analysis, *Structural analysis, Cracking (Fracturing), Load tests, Statistical analysis, Structural members, Time functions.

For abstract, see STAR 1213

N74-22551/7GA PC$7.25/MF$1.45
Royal Aircraft Establishment, Farnborough (England).
SOME VIBRATIONAL CHARACTERISTICS OF A COMBINED COLUMN-BEAM-MASS SYSTEM.
D. M. Ridland. Sep 73, 85p RAE-TR-73099, BR36778

Descriptors: *Cantilever beams, *Cockpit simulators, *Columns (Supports), *Rayleigh-ritz method, *Torsional vibration, Bending, Equations of motion, Mass distribution, Mathematical models, Problem solving, Stiffness, Transverse waves, Vibration tests.

For abstract, see STAR 1213

SLA-73-5827 PC$4.00/MF$1.45
Sandia Labs., Albuquerque, N.Mex. (Usa).
RESPONSE OF A FINITE CYLINDRICAL SHELL TO A COSINE IMPULSE OVER HALF ITS CIRCUMFERENCE.
M. J. Forrestal, W. K. Tucker, and W. A. Von Riesemann. 1973, 12p CONF-740412-1

Descriptors: (*Mechanical vibrations, *Simulators), Aluminium, Cylindrical configuration, Shells, Shock waves.

For abstract, see NSA 30 01, number 02410.

SLA-73-5927 PC$4.00/MF$1.45
Sandia Labs., Albuquerque, N.Mex. (Usa).
TRANSIENT WAVEFORM REPRODUCTION ON HYDRAULIC ACTUATORS USING A NON-LINEAR GAIN ESTIMATION TECHNIQUE.
N. F. Hunter. 1973, 15p CONF-740415-2

Descriptors: (*Mechanical vibrations, *Simulators), Nonlinear problems, Shock waves.

For abstract, see NSA 30 01, number 02411.

20L. Solid-State Physics

AD-780 601/1GA PC$3.00/MF$1.45
Wisconsin Univ Madison Mathematics Research Center
ON THE CONFLUENCE OF TWO COLLINEAR GRIFFITH CRACKS.
Technical summary rept.,
R. P. Srivastav. May 74, 11p Rept no. MRC-TSR-1432
Contract DA-31-124-ARO(D)-462

Descriptors: *Cracks, *Stresses, *Boundary value problems, Elastic properties, Fracture(Mechanics), Numerical analysis.
Identifiers: *Griffith crack.

The solution of the mixed boundary value problem for two collinear Griffith cracks is examined to determine the behavior of the elastic field as the adjacent ends of the cracks come closer. It is shown that the solution for the single crack is not the proper limit of the title problem. (Author)

AD-780 604/5GA Reprint
Harvard Univ Cambridge Mass Div of Engineering and Applied Physics
ON THE J INTEGRAL FOR AN INTERNALLY PRESSURIZED CYLINDRICAL SHELL WITH LONGITUDINAL CRACK,
John C. Amazigo. 8 Oct 73, 5p AFOSR-TR-74-0882
Grant AF-AFOSR-2476-73
Revision of report dated 30 Aug 73.
Availability: Pub. in International Jnl. of Fracture, v9 p492-494 1973.

Descriptors: *Shells(Structural forms), *Crack propagation, Potential energy, Fracture(Mechanics), Cylindrical bodies.
Identifiers: *J integral, *Cylindrical shells.

The well-known J integral or potential energy release rate for the semi-infinite crack in an infinitely long cylindrical shell is compared with the energy-release rate for a short crack derivable from the results of Copley and Sanders. The range of values of the nondimensionalized crack length for which shallow shell theory is valid is present for varying values of R/h. In spite of certain limitations a graph is presented which may prove useful in estimating the energy-release rate for cylindrical shells with longitudinal cracks of arbitrary length. (Author)

AD-780 626/8GA PC$6.00/MF$1.45
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Engineering
DIFFUSION OF SCANDIUM IN SINGLE CRYSTAL ALUMINUM OXIDE.
Master's thesis,
James E. Dockendorff. Mar 74, 58p Rept no. GAW/MC/74-4

Descriptors: *Scandium, *Diffusion, *Alumina, Single crystals, Tracer studies, Pressure, Defects(Materials), Theses.

The diffusion of scandium in single crystal aluminum oxide was studied using the Sc46 isotope as a radiotracer. An improved Gruzin method was used to determine the diffusion coefficients at various temperatures and oxygen partial pressures. The temperatures ranged between 1110C and 1465C. The oxygen partial pressures were 1 atmosphere and .0001 atmospheres. The dependence of the diffusion coefficient upon oxygen partial pressure was investigated to determine the type of mechanism controlling the diffusion of scandium in aluminum oxide. The dependence was observed to be very small. This tended to favor the Frenkl defect (formation of aluminum ion interstitials) mechanism as the primary controlling mechanism of the diffusion. (Modified author abstract)

AD-780 640/9GA PC$3.25/MF$1.45
Air Force Cambridge Research Labs L G Hanscom Field Mass
MAGNETOSTATIC SURFACE WAVES IN FERRIMAGNETS ABOVE 4 GHZ.
Physical sciences research papers,
James C. Sethares, and J. Bradford Merry. 28 Feb 74, 27p Rept nos. AFCRL-TR-74-0112, AFCRL-PSRP-587

Descriptors: *Magnetic materials, *Surface waves, Yttrium compounds, Iron compounds, Garnet, Microwave transmission, Transmission loss, Magnetostatics.
Identifiers: *Magnetostatic waves.

Microwave properties of magnetostatic surface waves in saturated ferrimagnets are described. Particular emphasis is given to experimental aspects of the subject. A summary background is given of pertinent experimental investigations of magnetostatic surface waves (MSSW) from 1968, when they were first observed, to the present. Certain features such as nonreciprocity, electronic tunability, and high coupling efficiencies are discussed. Propagation losses, between 4 and 15 GHz, on chemically-polished yttrium iron garnet (YIG) slabs were measured. Effects of inhomogeneous internal fields, the effects of placing metal conducting planes parallel to the surface upon which the waves propagate to modify the dispersion relation, and the effects of surrounding a single crystal slab (supporting resonant modes) with metal coated polycrystalline YIG to increase field homogeneity, are considered. Magnetostatic surface wave losses, above a few GHz, are less than those of acoustic surface waves. It is concluded that MSSW technology complements ASW technology at high frequencies. (Modified author abstract)

AD-780 706/8GA PC$3.00/MF$1.45
Advanced Research Projects Agency Arlington Va
NONCRYSTALLINE SEMICONDUCTORS: ELECTRICAL AND THERMAL PROCESSES,
Final rept.,
Lyle H. Slack. 1 Jun 74, 15p
Grant DA-ARO-D-31-124-72-G72, ARPA Order-1562

Descriptors: *Semiconducting films, *Amorphous materials, Switching, Threshold effects, Ceramic materials, Bismuth compounds, Zinc compounds, Oxides, Manganese oxides, Vanadium compounds, Phosphorus compounds.
Identifiers: *Amorphous semiconductors, Bismuth oxides, Zinc oxides, Vanadium pentoxide, Phosphorus oxides.

The worldwide scientific quest for an understanding of the switching phenomenon in amorphous semiconductor films faced a controversy as to whether it was a thermal or electronic process. A practical concern about the stability of chalcogenide switching devices prompted switching studies in the more stable oxides. These include oxides from the Bi2O3.ZnO.MnO ternary system and the

V2O5.P2O5 binary. A basic study compared the electronic spectra, structures, and electrical characteristics of several crystalline and noncrystalline semiconductors. A new technique for the preparation of oxide films was developed.

AD-780 736/5GA PC$3.25/MF$1.45
Ballistic Research Labs Aberdeen Proving Ground Md
REFLECTION OF WEAK SHOCK WAVES IN ELASTIC SOLIDS,
Thomas W. Wright. Apr 74, 44p Rept no. BRL-1711
Supersedes Rept. no. IMR no. 27.

Descriptors: *Solids, *Shock waves, Elastic properties, Mathematical models, Partial differential equations, Numerical analysis.

The general theory of shock reflections in simple elastic materials leads to a set of implicit functions, obtained from boundary conditions, that must be satisfied identically by the amplitude parameters of the incident and reflected waves. In principal, inversion of the boundary conditions leads to expressions for the reflection parameters as functions of the incident parameter. In practice, even numerical inversion appears to be a formidable task, and complete analytical inversion is generally impossible. For weak shocks, the reflections may be computed in powers of the incident amplitude. A formal scheme for solution of the weak shock case is developed in the report. (Modified author abstract)

AD-780 876/9GA Reprint
Air Force Cambridge Research Labs L G Hanscom Field Mass
NUMERICAL SOLUTION OF THE SPENCER-LEWIS EQUATION FOR KILOVOLT ELECTRON TRANSPORT IN PLANE SLABS,
John C. Garth, and John V. O'Brien. 1973, 11p Rept no. AFCRL-TR-74-0244
Availability: Pub. in IEEE Transaction on Nuclear Sciences, vNS20 n6 p82-90 Dec 73.

Descriptors: *Photoelectric emission, *Electron transport, X rays, Solids, Numerical analysis.
Identifiers: BOLT computer program, Spencer-Lewis equation.

The authors have developed a computer program BOLT for the numerical solution of the Spencer-Lewis equation for kilovolt electron transport in finite slabs.

AD-780 877/7GA Reprint
Air Force Cambridge Research Labs L G Hanscom Field Mass
X-RAY INDUCED ELECTRON EMISSION II,
John N. Bradford. 1973, 8p Rept no. AFCRL-TR-74-0245
Availability: Pub. in IEEE Transactions on Nuclear Science, vNS20 n6 p105-110 Dec 73.

Descriptors: *X rays, *Aluminum, *Tantalum, *Photoelectric emission, *Electron emission, Electron energy, Graphics, Monte Carlo method.
Identifiers: POEM computer program.

The x-ray induced photoemission measurements made at AFCRL have been used as a basis for comparison to the computed results of the POEM Monte Carlo electron transport code. The results show spectral shapes which closely resemble the experimental data and absolute yield values which agree within 15-27%. The measurements have been continued and the angular distributions from irradiated Al and Ta plates have been determined. The Ta distribution function for electron emission changes from cos theta about the surface normal for normally incident x-rays to isotropic for large angles of incidence. The Al in contrast changes from cos theta for normal incidence to a forward lobed shape for large angles of incidence. Both target materials show substantial yield increases at increasing angles of incidence. (Author)

AD-780 893/4GA PC$3.25/MF$1.45
Rensselaer Polytechnic Inst Troy N Y Mechanics Div
NONLINEAR ELECTROELASTIC EQUATIONS CUBIC IN THE SMALL FIELD VARIABLES.
Technical rept.,
H. F. Tiersten. May 74, 26p Rept no. TR-10
Contract N00014-67-A-0117-0007

Descriptors: *Elastic properties, *Nonlinear differential equations, Electrostatics, Stresses, Surface waves, Equations of motion, Numerical analysis.
Identifiers: *Electroelasticity, Second harmonic generation.

The nonlinear differential equations and boundary conditions containing terms up to cubic in the small field variables are obtained from general rotationally invariant nonlinear electroelastic equations derived previously. The electroelastic equations cubic in the small field variables are considerably more tractable than the general electroelastic equations and are applicable in the description of such phenomena as the dependence of wave velocities on wave amplitudes and resonant frequencies on vibration amplitudes in addition to a host of other nonlinear phenomena. The nonlinear constitutive equations for an isotropic purely elastic solid containing terms up to cubic in the small mechanical displacement gradients are presented. The nonlinear equations for the extensional motion of thin isotropic plates containing terms up to cubic in the small mechanical displacement gradients in the plane of the plate are obtained and the influence of the vertical inertia is included, in addition to the extensional stiffness and inertia, when the plating is attached to an electroelastic solid. (Author)

AD-780 902/3GA PC$5.50/MF$1.45
Pennsylvania State Univ University Park Materials Research Lab
FERROIC CRYSTALS FOR ELECTRO-OPTIC AND ACOUSTO-OPTIC APPLICATIONS.
Annual rept.,
L. E. Cross, and R. E. Newnham. 28 Jun 74, 191p
Contract N00014-67-A-0385-0023

Descriptors: *Ferroelectric crystals, *Acoustooptics, *Electrooptics, Lead compounds, Germanates, Crystal structure, Phase transformations, Elastic properties, Magnetic domains, Twinning(Crystallography), Tin compounds, Titanium compounds, Tellurium compounds, Oxides, Crystal growth.
Identifiers: Lead germanates, Tin tellurates, Titanium tellurates.

Contents:
Experimental studies on lead germanate Pb5Ge3O11;
Elastic behavior of isopropyl ammonium chlorostannate (IPACS);
New ferroelastic and ferroelastic-ferroelectric crystals for acousto-optic applications;
Symmetry of ferroic crystals.

AD-780 903/1GA PC$3.75/MF$1.45
Westinghouse Research Labs Pittsburgh Pa
INVESTIGATION OF FLUX PINNING AND CRITICAL CURRENT DENSITIES IN TYPE II SUPERCONDUCTORS.
Technical rept. 1 Jul 73-30 Jun 74,
Daniel W. Deis, Mahendra P. Mathur, Martin Ashkin, and Clifford K. Jones. 20 Jun 74, 53p Rept no. 74-9J2-FLPIN-R1-TR-2
Contract N00014-73-C-0026
See also AD-765 368.

Descriptors: *Superconductors, *Magnetization, Electric current, Density, Niobium, Niobium alloys, Titanium alloys, Zirconium, Scaling factors.
Identifiers: Critical phenomena, Flux pinning.

Magnetization measurements, M(H,T) were made on a series of Nb and NbTi multifilament conductors as well as a series of heat treated monofilament Nb-25%Zr conductors. From these measurements the pinning force (F sub p) (H,T) and the critical current characteristics, (J sub c)(H) are deduced for all samples. The scaling law theory of flux pinning was found to be valid, in general, for all these materials. Metallurgical examinations have been made on the Nb-Zr samples to relate heat treatment, J sub c and microstructure. (Author)

AD-780 949/4GA Reprint
State Univ of New York Stony Brook Dept of Materials Science
SURFACE DEBYE TEMPERATURE OF THE SI(001)-2X2 STRUCTURE,
A. Ignatiev, and V. Jona. 26 Nov 73, 7p AFOSR-TR-74-0950
Grant AF-AFOSR-2151-72

Descriptors: *Silicon, *Surface temperature, Low energy, Electron diffraction, Electron energy, Correlation techniques.
Identifiers: Debye temperature, Low energy electron diffraction.

The effective surface Debye Temperature for Si (001) 2x2 has been determined as a function of the incident electron energy. (Author)

AD-780 968/4GA PC$3.25/MF$1.45
California Univ Los Angeles Dept of Physics
CRYSTALLINE FIELD EFFECTS IN INTERMETALLIC COMPOUNDS.
Technical rept.,
D. Davidov, E. Bucher, L. W. Rupp, Jr., L. D. Longinotti, and C. Rettori. Sep 73, 36p
Contract N00014-69-A-0200-4032, Grant NSF-GH-31973
Prepared in cooperation with Bell Telephone Labs., Murray Hill, N.J.

Descriptors: *Electron paramagnetic resonance, *Rare earth elements, *Intermetallic compounds, Cerium, Dysprosium, Erbium, Ytterbium, Ground state, Atomic energy levels, Lanthanum compounds, Palladium alloys, Antimonides, Bismuth alloys, Borides.
Identifiers: Cubic lattices, Lanthanum intermetallics, Palladium intermetallics, Bismuth intermetallics, Lanthanum antimonides, Lutetium antimonides, Lutetium intermetallics, Lanthanum borides.

Electron spin resonance of the rare-earth ions Ce(+3), Dy(+3), Er(+3) and Yb(+3) has been observed in various cubic intermetallic compounds. Experimental results indicate the ground states to be (a) gamma 7 for Yb(+3) in LaPd3 (Cu3Au structure) (b) gamma 8 for Er(+3) in LaSb, LuSb, LaBi and LuBi (NaCl structure) (c) gamma 7 for Ce(+3) in LaSb (d) gamma 6 for Dy(+3) in LaSb (e) gamma 6 for Yb(+3) in LaSb (f) gamma 6 for Er in LaB6 (CaB6 structure). These data represent the first observations of anisotropic resonance and hyperfine structure in intermetallic compounds as well as the first observation of EPR of Ce(+3) in any metal. The observations are consistent with crystalline field parameters deduced from measurements of concentrated spin systems with the same structure, by means of other experimental techniques. Analysis of the crystalline field parameters in terms of the point charge model, the virtual bound state model and possible f-like contributions is given. (Author)

AD-780 999/9GA PC$4.00/MF$1.45
Army Foreign Science and Technology Center Charlottesville Va
INVESTIGATION OF POSSIBILITIES FOR IMPROVEMENT IN STABILITY OF PHOTOELECTRIC CHARACTERISTICS OF IRRADIATED SILICON P-N JUNCTIONS,
G. M. Grigoreva. 10 Jan 73, 10p Rept no. FSTC-HT-23-1436-72
Trans. from Nauka i Tekhnika (USSR) p167-173 1970.

Descriptors: *Semiconductor junctions, *Photoconductivity, *Silicon, *Radiation effects, Annealing, Doping, Lithium, Translations, USSR.

Methods are considered for increasing the stability of photoconverters operating in the conditions of hard radiation action. One of the methods in question is thermal annealing of the irradiated devices. A change is considered in the process of annealing of the spectral distribution of photosensitivity and the diffusion length of the minority carriers in the base of irradiated n-p type photoconverters. Another possibility for assuring radiation resistance is doping them with lithium. The results are presented of irradiation and low-temperature annealing of p-a type photoconverters with an impurity of lithium and various concentrations of oxygen. In the case when the content of oxygen in silicon is small (< 10 to the 17th power/cc) devices with an impurity of lithium reveal an extremely high resistance to irradiation. The ability of lithium to neutralize recombination centers in silicon having a nonradiation origin is also shown. (Author)

AD-781 068/2GA Reprint
Belfer Graduate School of Science New York
TRICRITICAL BEHAVIOR OF AN ORNSTEIN-ZERNIKE SYSTEM,
G. Stell. 3 Jan 74, 4p AFOSR-TR-74-0925
Grant AF-AFOSR-2430-73
Availability: Pub. in Physics Letters, v47A n2 p155-156, 11 Mar 74.

Descriptors: *Magnetic materials, Thermophysical properties, Phase transformations, Mathematical models.
Identifiers: *Ising model, *Critical point.

The 'Ornstein-Zernike' tricritical point is investigated. It is found that its behavior differs markedly from both the predictions of classical theory and those of recent renormalization-group results. (Author)

AD-781 082/3GA Reprint
Texas Univ Austin Dept of Physics
ON THE EXISTENCE OF LONG-WAVELENGTH SHEAR-HORIZONTAL SURFACE WAVES ON THE BCC (001) SURFACE,
V. L. Zoth, G. P. Alldredge, and F. W. De Wette. 21 Nov 73, 5p AFOSR-TR-74-0840
Grant AF-AFOSR-1973-71
Availability: Pub. in Physics Letters, v47A n3 p247-248, 25 Mar 74.

Descriptors: *Phonons, *Surface waves, Crystal lattices, Propagation.
Identifiers: Body centered cubic lattices.

Long-wavelength, low-frequency shear-horizontal surface waves are found to exist along (100), but not (110), directions of propagation on the (001) face for a simple but fairly realistic model of monatomic body-centered cubic crystals. This domain of existence contrasts with that found previously on the (001) face of monatomic simple cubic and both monatomic and rocksalt face-centered cubic structures, where such waves exist along (110), but not (100). (Author)

AD-781 116/9GA Reprint
Washington Univ Seattle Dept of Physics
GENERALIZED COHERENT-POTENTIAL METHOD FOR DISORDERED SYSTEMS.
Interim rept.,
Edward A. Stern, and Avner Zin. 17 Aug 73, 13p AFOSR-TR-74-0839
Grant AF-AFOSR-1967-71
Availability: Pub. in Physical Review B, v9 n4 p1170-1179, 15 Feb 74.

Descriptors: *Band theory of solids, *Binary alloys, Disorder, Approximation(Mathematics).
Identifiers: *Coherent potential approximation, Density of states.

A tractable way to generalize the coherent-potential method beyond the coherent-potential approximation (CPA) is presented. Explicit expressions are derived for a single-band tight-binding-approximation model including the correlations between first nearest neighbors. The potential change when one atom type is replaced by another at a given site is assumed to extend beyond that site so as to satisfy perfect shielding and include hopping-term variations. By considering the restrictions imposed by perfect shielding throughout the whole concentration range, two more conditions on the potential are found in addition to that corresponding to the Friedel sum rule. (Modified author abstract)

AD-781 117/7GA Reprint
California Univ Irvine Dept of Physics
EFFECTS OF STRAINS ON OPTICAL MODE PROPERTIES IN CRYSTALS OF THE ROCKSALT AND ZINC-BLENDE STRUCTURES.
Interim rept.,
L. B. Humphreys, and A. A. Maradudin. 8 Jan 74, 16p Rept no. TR-72-64 AFOSR-TR-74-0841
Grant AF-AFOSR-2018-71
Revision of report dated 12 Feb 73.
Availability: Pub. in Physical Review B, v9 n4 p1823-1835, 15 Feb 74.

Descriptors: *Crystals, *Strain(Mechanics), Crystal lattices, Vibration, Deformation, Polarization, Dielectric properties, Optical properties, Gallium arsenides, Potassium compounds, Chlorides.
Identifiers: Potassium chloride.

A microscopic, lattice-dynamical theory is presented of the effects of strains on the frequencies of vector k approximately equal to 0 optical modes and transverse effective charges in polar crystals. The general results are applied to cubic crystals of the rocksalt and zinc-blende structures. The strain dependence of the transverse effective charge and the optical-frequency dielectric constant is incorporated into the theory together with the strain dependence of the atomic force constants associated with the short-range interatomic forces. A theory of the effects of strains on polariton dispersion curves in crystals of the rocksalt and zinc-blende structures is also presented. The predictions of the theory, calculated on the basis of simple models of crystals of the rocksalt and zinc-blende structures, are compared with existing experimental data. (Author)

AD-781 118/5GA Reprint
Illinois Univ Urbana Dept of Electrical Engineering
HOT CARRIERS IN SILICON SURFACE INVERSION LAYERS.
Interim rept.,
Karl Hess, and C. T. Sah. 14 Sep 73, 7p AFOSR-TR-74-0849
Grant AF-AFOSR-2067-71
Availability: Pub. in Jnl. of Applied Physics, v45 n3 p1254-1257 Mar 74.

Descriptors: *Semiconductors, *Silicon, *Electrical conductivity, Bulk materials, Boltzmann equation.
Identifiers: *Carrier mobility, Hot electrons.

Calculations of the carrier mobility of electrons and holes vs the electrical field strength E are presented. The calculations have been performed based on a Maxwellian distribution and taking into account a repopulation of carriers among different valleys in the case of n-channel silicon inversion layers. The energy loss of the carriers to the lattice and the drift velocity or mobility are treated as two dimensional. Formulas for the energy loss are presented for both high and very low temperatures considering scattering by optical and acoustical phonons. The calculations are compared with experimental values given by Fang and Fowler and by Sato et al. Good agreement is found for the high-temperature case using coupling constants as given by Sah et al. Quite large differences between theory and experiment appear at very low temperatures. The origin of these differences is discussed in a final section. (Author)

AD-781 135/9GA PC$3.00/MF$1.45
Westinghouse Research Labs Pittsburgh Pa
HIGH CRITICAL TEMPERATURE-HIGH FIELD SUPERCONDUCTORS.
Final rept. 1 Jul 71-30 Jul 74,
Daniel W. Deis, John R. Gavaler, and William T. Reynolds. 1 Jul 74, 13p Rept no. 74-9J2-HICON-R1 AFOSR-TR-74-0989
Contract F44620-71-C-0045

Descriptors: *Superconductors, Bulk materials, Thin films, Niobium alloys, Germanium alloys, Tin alloys, Vanadium alloys, Gallium alloys, Sputtering, Transition temperature, Cold drawing, Heat treatment.
Identifiers: Niobium intermetallics, Aluminum intermetallics, Gallium intermetallics, Germanium intermetallics, Silicon intermetallics.

Investigations of new bulk and thin film conductor materials with the A-15 structure have yielded several new high transition temperature compounds. The most significant of these was thin film niobium-germanium prepared by a new sputtering technique. Under the proper sputtering conditions films have been deposited with the highest transition temperature, 23K, of any presently known superconductor. In addition, techniques and apparatus have been devised, constructed and tested for the assembly, consolidation, cold drawing and heat treatment of composite multifilamentary conductors employing niobium tin and vanadium gallium. The superconducting and metallurgical properties of a number of these conductors were extensively investigated. (Author)

AD-781 142/5GA PC$3.25/MF$1.45
California Univ Irvine Dept of Physics
THEORY OF SURFACE MAGNETOPLASMONS IN LEAD CHALCOGENIDES.
Final rept.,
J. J. Brion, and R. F. Wallis. Jun 74, 44p Rept no. TR-73-51
Contract N00014-69-A-0200-9003

Descriptors: *Semiconductors, *Surface properties, *Plasmons, Fermi surfaces, Lead compounds, Chalcogens, Germanium, Magnetic fields, Tellurides.
Identifiers: Polaritons, *Lead tellurides.

A previously developed theory of surface polaritons is used to calculate the surface magnetoplasmon modes for materials with anisotropic energy surfaces such as the lead chalcogenides and n-type germanium. These materials are characterized by a Fermi surface consisting of prolate spheroids with axes in the (111) symmetry directions. Results are compared to the surface magnetoplasmon modes in substances having a spherical Fermi surface. Specific calculations are made for p-type PbTe with the external magnetic field parallel to the (100) and (110) directions, with the surface parallel to and perpendicular to the magnetic field. Retardation is included for the case of the magnetic field parallel to the surface and the direction of propagation normal to the field. (Author)

BNL-18726 PC$4.00/MF$1.45
Brookhaven National Lab., Upton, N.Y. (Usa); Yale Univ., New Haven, Conn. (Usa).
INELASTIC NEUTRON SCATTERING FROM AMORPHOUS GERMANIUM.
J. D. Axe, D. T. Keating, G. S. III Cargill, and R. Alben. 1974, 4p CONF-740313-3

Descriptors: (*Germanium, *Vibrational states), Amorphous state, Inelastic scattering, Neutron beams.

For abstract, see NSA 30 01, number 00856.

CEA-CONF-2537 PC$3.00/MF$1.45
Cea Centre d'Etudes Nucleaires de Grenoble, 38 (France). Lab. D'Electronique et de Technologie de l'Informatique.
GARNET FILMS CHARACTERIZATION.
D. Challeton, and J. C. Gay. 6 Oct 73, 14p CONF-730994-1

Descriptors: (*Garnets, Films), (*Films, *Measuring methods), Bubbles, Magnetism, Thickness.

For abstract, see NSA 30 01, number 02391.

CEA-CONF-2548 PC$5.25/MF$1.45
Cea Centre d'Etudes Nucleaires de Fontenay-aux-Roses, 92 (France).
GENERAL SURVEY OF POINT DEFECTS.
Y. Quere. 1973, 64p CONF-730685-1
In French.

Descriptors: (*Crystal lattices, *Point defects), Absorption, Crystal structure, Diffusion, Elasticity, Lattice parameters, Metals, Molecular structure, Recrystallization, Simulation, Specific heat, Thermoluminescence, Vacancies.

For abstract, see NSA 30 01, number 02321.

COO-3151-37 PC$4.00/MF$1.45
Cornell Univ., Ithaca, N.Y. (Usa). Lab. Of Atomic and Solid State Physics.
SECONDARY HIGH PRESSURE STANDARD FOR THE FAR-INFRARED SPECTRAL REGION. REPORT NO. 2170.
B. T. Smith, and A. J. Sievers. Feb 74, 6p
Contract AT(11-1)-3151

Descriptors: (*Sodium chlorides, *Crystal lattices), (*Copper ions, *Inclusions), Defects, Infrared radiation, Pressure dependence, Solids, Standards, Ultralow temperature, Very low temperature.

For abstract, see NSA 30 01, number 02324.

COO-3158-27 PC$5.00/MF$1.45
Cornell Univ., Ithaca, N.Y. (Usa).
INTERATOMIC POTENTIALS AND DEFECT ENERGETICS IN DILUTE ALLOYS. REPORT NO. 2158.
P. S. Ho, and R. Benedek. 20 Dec 73, 36p
Contract AT(11-1)-3158

Descriptors: (*Aluminium alloys, *Defects), (*Alloys, Defects), Activation energy, Atoms, Binding energy, Diffusion, Green function, Impurities, Interatomic forces, Potential energy, Relaxation, Vacancies.

For abstract, see NSA 30 01, number 02325.

COO-3331-6 PC$4.00/MF$1.45
Massachusetts Univ., Amherst (Usa).
ULTRASONIC ATTENUATION STUDIES OF THE ELECTRONIC STRUCTURE OF METALS. PROGRESS REPORT, JUNE 1, 1973--MAY 31, 1974.
A. R. Hoffman. 1974, 9p
Contract AT(11-1)-3331

Descriptors: (*Beryllium, *Thermal conductivity), Magnetic fields, Temperature dependence, Ultralow temperature, Very low temperature.

For abstract, see NSA 30 01, number 00866.

FRNC-CONF-94 PC$3.25/MF$1.45
Max-Planck-Institut fuer Kernphysik, Heidelberg (F.R. Germany); Centre National de la Recherche Scientifique, 67 - Strasbourg (France). Centre de Recherches Nucleaires.
AMORPHIZATION, RECRYSTALLIZATION, AND ELECTRICAL ACTIVITY OF IMPLANTED SI LAYERS.
R. Prisslinger, S. Kalbitzer, J. J. Grob, and P. Siffert. 1973, 24p CONF-730574-12
In French.

Descriptors: (*Silicon, *Ion implantation), Aluminium ions, Amorphous state, Annealing, Electrical properties, Ion beams, Medium temperature, Monocrystals, Phosphorus ions, Recrystallization, Silicon ions.

For abstract, see NSA 30 01, number 02328.

FRNC-TH-448 PC$13.00/MF$1.45
Grenoble-1 Univ., 38 (France).
APPLICATION OF THE MOESSBAUER EFFECT TO STUDIES OF INVAR TYPE IRON--NICKEL ALLOYS.
H. Rechenberg. 1973, 196p
In French.

Descriptors: (*Invar, *Magnetic properties), (*Iron 57, *Moessbauer effect), Electron beams, Fcc lattices, Hyperfine structure, Nickel alloys, Physical radiation effects, Powders, Spectroscopy.

For abstract, see NSA 30 01, number 02329.

INP-858 PC$5.00/MF$1.45
Institute of Nuclear Physics, Krakow (Poland).
CALCULATIONS OF EFG AND PAC ATTENUATION FROM RANDOMLY DISTRIBUTED SOLUTES IN CUBIC LATTICES.
J. Kajfosz. 1973, 38p

Descriptors: (*Crystal lattices, *Integral pac), Atoms, Crystal field, Distribution, Electric fields, Monte carlo method.

For abstract, see NSA 30 01, number 02263.

ITF-73-142-E PC$4.00/MF$1.45
An Ukrainskoj SSR, Kiev. Inst. Teoreticheskoj Fiziki.
SHAPE OF THE BAND OF LIGHT ABSORPTION BY AN IONIC CRYSTAL IN THE EXCITON REGION.
A. F. Lubchenko, V. M. Nitsovich, and N. V. Tkach. 1973, 16p

Descriptors: Bogolyubov method, Crystals, Excitons, Green function, Phonons.

For abstract, see NSA 30 01, number 02330.

ITF-73-156-P PC$5.25/MF$1.45
An Ukrainskoj SSR, Kiev. Inst. Teoreticheskoj Fiziki.
MODERN METHODS OF QUANTUM THEORY IN THE ISING MODEL. SPIN--PHOTON INTERACTION IN THE ISING MODEL.
V. A. Zagrebnov, and V. K. Fedyanin. 1973, 44p
In Russian.

Descriptors: Crystal lattices, Ferromagnetic materials, Green function, Paramagnetism, Quantum mechanics.

For abstract, see NSA 30 01, number 02331.

ITF-73-168-P PC$4.25/MF$1.45
An Ukrainskoj SSR, Kiev. Inst. Teoreticheskoj Fiziki.
SELF-CONSISTENT FIELD APPROXIMATION IN DE GENNES MODEL.
R. R. Levitskii, and I. V. Stasyuk. 1973, 22p
In Russian.

Descriptors: (*Ferroelectric materials, *Self-consistent field), Correlation functions, Damping, Diagrams, Dipoles, Hamiltonians, Hydrogen, Interaction range, Linear momentum, Mathematical operators, Polarization, Protons, Spin.

For abstract, see NSA 30 01, number 02265.

JUL-1039-FF PC$8.50/MF$1.45
Kernforschungsanlage Juelich G.M.B.H. (F.R. Germany). Inst. Fuer Festkoerperforschung.
ELASTIC INTERACTION AND PHASE TRANSITION IN COHERENT METAL--HYDROGEN SYSTEMS.
H. Wagner, and H. Horner. Jan 74, 106p

Descriptors: (*Hydrogen compounds, *Magnetic susceptibility), (*Metals, Magnetic susceptibility), Boundary conditions, Curie-weiss law, Dissolution, Elasticity, Interactions, Ions, Phase transformations, Protons, Statistics.

For abstract, see NSA 30 01, number 02333.

KFKI-72-61 PC$4.00/MF$1.45
Kozponti Fizikai Kutato Intezet, Budapest (Hungary).
QUADRUPOLAR NMR LINE-BROADENING IN AL--3D-TRANSITION METAL ALLOYS.
E. Serfozo, E. Kovacs-Csetenyi, and G. Gruener. 1972, 16p

Descriptors: (*Aluminium 27, *Nuclear magnetic resonance), (*Aluminium base alloys, Nuclear magnetic resonance), Cold working, Line broadening, Quadrupoles, Quenching, Vanadium alloys, Chromium alloys, Copper alloys, Zinc alloys, Iron alloys.

For abstract, see NSA 30 01, number 00868.

N74-22321/5GA PC$4.00/MF$1.45
National Aeronautics and Space Administration, Washington, D.C.
MAGNETO-OPTICS: OPTICAL DETECTION OF PARAMAGNETIC ELECTRONIC RESONANCE BY MEASURING THE PARAMAGNETIC ROTARY POLARIZATION OF A VISIBLE RADIATION.
A. Kastler. Jul 73, 4p NASA-TT-F-14725
Tran-Transl. Into English from Compt. Rend. (Paris), V. 232, No. 10, 1951 p 62-64.

Descriptors: *Electron paramagnetic resonance, *Light (Visible radiation), *Optical measurement, Magnetic fields, Magneto-optics, Polarization (Charge separation).

For abstract, see STAR 1213

N74-22382/7GA PC$4.00/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
CONDUCTIVITY OF BOULES OF SINGLE CRYSTAL SODIUM BETA-ALUMINA.
W. L. Fielder, H. E. Kautz, J. S. Fordyce, and J. Singer. 1974, 19p NASA-TM-X-71546, E-7955
Conf-Presented at Ann. Meeting of the Electrochem. Soc. San Francisco, 12-14 May 1974.

Descriptors: *Electrochemistry, *Electroconductivity, *Polarization characteristics, *Single crystals, *Sodium compounds, Crystal structure, Electrical properties, Materials tests, Temperature effects.

For abstract, see STAR 1213

N74-22387/6GA PC$4.00/MF$1.45
Siemens-Schuckertwerke A.G., Erlangen (West Germany).
SYSTEM REPRESENTATION OF THE ELECTRODYNAMIC SUSPENSION PRINCIPLE SYSTEMDARSTELLUNG DES ELEKTRODYNAMISCHEN SCHWEBEPRINZIPS.
E. Kill. 1973, 15p DGLR-PAPER-73-155
Conf-Presented at the Dglr Symp. Moeglichkeiten Eines Spurgebundenen Hochgeschwindigkeitsverkehrs, Bonn, 6 Nov. 1973.
Language in German.

Descriptors: *Electrodynamics, *Magnetic suspension, *Rail transportation, *Superconducting magnets, Cryogenic equipment, Magnetic induction, Rapid transit systems.

For abstract, see STAR 1213

N74-22388/4GA PC$5.25/MF$1.45
Departement d'Etudes et de Recherches en Technologie Spatiale, Toulouse (France).
IRRADIATION DESTRUCTION OF M CENTERS IN THE MAGNESIUM FLUORIDE DESTRUCTION, PAR IRRADIATION, DES CENTRES M DANS LE MGF2.
G. Panabiere, M. Romero, and M. Soulet. Jan 74, 42p ONERA-DERTS-NT-02-34
Language in French.

Descriptors: *Crystal defects, *Electron irradiation, *Magnesium fluorides, *Radiation effects, Band structure of solids, Color centers, Destruction, Interstitials, Radiation absorption, Recombination reactions, Temperature effects.

For abstract, see STAR 1213

SLA-73-7074 PC$4.00/MF$1.45
Sandia Labs., Albuquerque, N.Mex. (Usa).
IN-SITU TRANSPORT MEASUREMENTS ON UHV GROWN A-GE SAMPLES.
M. L. Knotek. 1974, 11p CONF-740313-2

Descriptors: (*Germanium, *Electric conductivity), Annealing, Auger effect, Deposition, High temperature, Medium temperature, Semiconductor materials, Substrates, Temperature dependence, Thermal conductivity, Thickness, Tunnel effect.

For abstract, see NSA 30 01, number 02369.

SLA-73-8004 PC$4.50/MF$1.45
Sandia Labs., Albuquerque, N.Mex. (Usa).
HIGH DENSITY DAMAGE IN AL SUB 2 O SUB 3 BY LOW ENERGY PROTON IMPLANTATION.
G. W. Arnold. 30p CONF-740402-5

Descriptors: (*Aluminium oxides, *Physical radiation effects), Absorption spectra, Crystal defects, Ion implantation, Proton beams.

For abstract, see NSA 30 01, number 00782.

UCID-16171 PC$4.00/MF$1.45
California Univ., Livermore (Usa). Lawrence Livermore Lab.
USERS MANUAL FOR CODE EPSOL. STATIC ANALYSIS OF ELASTIC--PLASTIC SOLIDS.
M. Hartzman. 13 Nov 72, 8p
Contract W-7405-eng-48

Descriptors: (*Computer codes, *E codes), (*Solids, *Stress analysis), Lawrence livermore laboratory, Manuals, Mechanical properties.

For abstract, see NSA 30 01, number 02257.

UCRL-74832 PC$4.00/MF$1.45
California Univ., Livermore (Usa). Lawrence Livermore Lab.
HIGH PURITY GERMANIUM--LOW TEMPERATURE HALL ANALYSES.
R. Wichner, S. P. Swierkowski, and G. A. Armantrout. 14 Nov 73, 18p CONF-731112-32

Descriptors: (*Germanium, *Hall effect), Aluminium, Boron, Chemical analysis, Contamination, Copper, Crystal growth, Defects, Energy levels, Gamma spectrometers, Impedance, Impurities, Low temperature, Oxides, Ultralow temperature, Vacancies, Very low temperature.

For abstract, see NSA 30 01, number 02376.

20M. Thermodynamics

COO-3077-35 PC$6.75/MF$1.45
New York Univ., N.Y. (Usa). Aec Computing and Applied Mathematics Center.
HELIUM AT ZERO TEMPERATURE WITH HARD-SPHERE AND OTHER FORCES.
M. H. Kalos, D. Levesque, and L. Verlet. Sep 73, 71p
Contract AT(11-1)-3077

Descriptors: (*Helium ii, *Hard-sphere model), Absolute zero temperature, Boundary conditions, Lennard-jones potential, Phonons.

For abstract, see NSA 30 01, number 01510.

COO-3285-9 PC$6.00/MF$1.45
Johns Hopkins Univ., Baltimore, MD. (Usa). Dept. Of Physics.
CRITICAL PHENOMENA AND RENORMALIZATION GROUP FOR OUTSIDERS.
S. Koevesi-Domokos. May 72, 58p

Descriptors: (*Gases, *Equations of state), (*Liquids, Equations of state), Critical pressure, Critical size, Critical temperature.

For abstract, see NSA 30 01, number 02395.

HU-TFT-73-29 PC$4.00/MF$1.45
Helsinki Univ. (Finland). Research Inst. For Theoretical Physics.
CONDENSATE SPIN CURRENTS IN HELIUM-3.
M. Vuorio. Nov 73, 9p

Descriptors: (*Helium 3, *Ginzburg-landau theory), Angular momentum, Critical velocity, Currents, Energy levels, Free energy, P states, P waves, Spin, Stability, Velocity.

For abstract, see NSA 30 01, number 01511.

N74-22564/0GA PC$24.25/MF$1.45
Lockheed Missiles and Space Co., Sunnyvale, Calif.
THERMAL PERFORMANCE OF MULTILAYER INSULATIONS.
Final Report.
C. W. Keller, G. R. Cunnington, and A. P. Glassford. 5 Apr 74, 421p NASA-CR-134477, LMSC-D349866
Contract NAS3-14377

Descriptors: *Composite materials, *Gas evolution, *Multilayer insulation, *Thermodynamic properties, High temperature tests, Materials tests, Mylar (Trademark), Test equipment.

For abstract, see STAR 1213

N74-22565/7GA PC$9.00/MF$1.45
National Research Council of Canada, Ottawa (Ontario). Div. of Mechanical Engineering.
AN EXPERIMENTAL METHOD FOR SPRAY EVAPORATION STUDIES.
Mechanical Engineering Report.
J. K. S. Wong. Mar 73, 117p NRC-13306, MP-61

Descriptors: *Evaporation rate, *Fuel sprays, *Heat transfer, *Thermodynamic properties, Evaporative cooling, Physical properties, Volatility.

For abstract, see STAR 1213

N74-22568/1GA PC$4.00/MF$1.45
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
HEAT TRANSFER TO SURFACE AND GAPS OF RSI TILE ARRAYS IN TURBULENT FLOW AT MACH 10.3.
D. A. Throckmorton. Apr 74, 100p NASA-TM-X-71945

Descriptors: *Boundary layer flow, *Heat transfer, *Thermal insulation, *Tiles, *Wall flow, *Wind tunnel tests, Composite materials, Materials tests, Thermodynamic properties.

For abstract, see STAR 1213

20N. Wave Propagation

AD-780 588/0GA PC$3.00/MF$1.45
Air Force Weapons Lab Kirtland AFB N Mex
EFFECTS OF NUCLEAR SCATTERING AND ENERGY LOSS ON SMALL SIGNAL HIGH-ALTITUDE ELECTROMAGNETIC PULSE CALCULATIONS.
Final rept. Mar-Dec 73,
L. A. Wittwer, James E. Brau, and Gregory H. Canavan. Jun 74, 25p Rept no. AFWL-TR-74-46

Descriptors: *Electromagnetic pulses, Nuclear explosions, High altitude, Nuclear scattering, Energy, Losses, Monte Carlo method, Partial differential equations, Electric fields.

The effects of nuclear scattering and ionization energy loss on the electromagnetic fields from high-altitude bursts are examined using Monte Carlo techniques to calculate electron trajectories. Maxwell's equations and the Lienard-Wiechert potentials are both used to evaluate the fields. The obliquity model is demonstrated to be an adequate treatment of such effects in electromagnetic pulse calculations. (Author)

AD-780 602/9GA PC$3.25/MF$1.45
Rand Corp Santa Monica Calif
ATMOSPHERIC EFFECTS ON TERRESTRIAL MILLIMETER-WAVE COMMUNICATIONS,
S. J. Dudzinsky, Jr. Mar 74, 46p Rept no. R-1335-ARPA
Contract DAHC15-73-C-0181, ARPA Order-189

Descriptors: *Communication and radio systems, *Millimeter waves, *Transmission loss, Rain, Snow, Hail, Fog, Oxygen, Water vapor, Absorption.
Identifiers: *Atmospheric attenuation.

A methodology is given for quantitatively estimating the performance of millimeter-wave systems (30-300 GHz) in the atmosphere and in the presence of rainfall. Information on the transmission properties of millimeter waves is combined with currently available meteorological data to derive the methodology. The available propagation and rainfall data for a given climatic region are used to derive curves giving attenuation due to rainfall versus path length for various frequencies. Emphasis is on high-reliability communcations in which outages are 0.1 percent (530 min of outage per year) or less, but the methodology described applies to higher outage systems as well. (Author)

AD-780 712/6GA PC$18.25/MF$1.45
Army Communications Command Fort Huachuca Ariz Advanced Concepts Office
WORKSHOP ON RADIO SYSTEMS IN FORESTED AND/OR VEGETATED ENVIRONMENTS.
Technical rept.,
J. R. Wait, R. H. Ott, and T. Telfer. Feb 74, 313p Rept no. ACC-ACO-1-74
Summaries of 20 Technical Papers and 4 Working Group Reports presented at subject Workshop held at Fort Huachuca, Ariz., on 6-9 Nov 73.

Descriptors: *Electromagnetic wave propagation, *Radio transmission, *Meetings, Reviews, State of the art, Jungles, Forests, Environments, Radar, Losses, Propagation, Spectra, Utilization, Electrical properties, Vegetation, Southeast Asia, Computerized simulation.
Identifiers: SEACORE Project.

The purpose of the Workshop was to review the state-of-the-art in the theory of operation and design of radio systems for which the air/earth in-

terface becomes a controlling factor. Each of the twenty technical papers are presented in summary, with the name of the author, his affiliation and address for each. The papers are principally devoted to radio and radar propagation in jungles and forests, path loss predictions, electrical characteristics of the forest and earth media, and lateral wave applications. The Working Group reports cover: (1) Application of Antenna and Propagation Theory; (2) Spectrum Usage Below 300 MHz (including UHF Radio 225-400 MHz, but exclusive of radar); (3) Spectrum Usage above 300 MHz (including radar above 30 MHz, but exclusive of UHF radio 225-400 MHz); and, (4) Environmental Descriptions (in relation to propagation and system performance modeling). Appendices provide names and addresses of all attendees, and a bibliographic summary of reports and articles from Project SEACORE, which was sponsored by the Advanced Research Projects Agency and the U. S. Army Electronics Command. (Author)

AD-781 076/5GA PC$3.25/MF$1.45
Michigan Univ Ann Arbor Radiation Lab
MATHEMATICS OF GUIDED WAVE PROPAGATION IN OPEN STRUCTURES.
Final scientific rept.,
Chiao-Min Chu. May 74, 48p Rept no. 011778-1-F AFOSR-TR-74-0898
Grant AF-AFOSR-2538-73

Descriptors: *Electromagnetic wave propagation, Dispersion relations, Transmission lines, Bessel functions, Approximation, Computations.
Identifiers: Hankel functions.

The propagation of electromagnetic waves along open structures whose transverse cross section are composed of two symmetrically placed circular sectors is investigated. The problem is first formulated in the form of a dual summation equation. By introducing a new set of basis functions to represent the surface field, the dispersion relation for such a structure is developed, systematic techniques of finding the approximate solutions of the dispersion relation are formulated, and numerical solutions for the first two orders of approximation are carried out to illustrate the feasibility of using the technique. (Modified author abstract)

N74-21798/5GA PC$15.50/MF$1.45
Virginia Polytechnic Inst. and State Univ., Blacksburg. Electrical Engineering Dept.
THE INFLUENCE OF POLARIZATION ON MILLIMETER WAVE PROPAGATION THROUGH RAIN.
Interim Report.
C. W. Bostian, W. L. Stutzman, P. H. Wiley, and R. E. Marshall. 1 Jan 74, 247p NASA-CR-138150, IR-2
Contract NGR-47-004-091

Descriptors: *Millimeter waves, *Polarization (Waves), *Rain, *Wave attenuation, *Wave propagation, Parabolic antennas, Signal analysis, Signal detection, Signal measurement.

For abstract, see STAR 1213

N74-21802/5GA PC$4.00/MF$1.45
Scientific Translation Service, Santa Barbara, Calif.
THE VALIDITY OF THE RAYLEIGH EXPANSION.
M. Neviere, and M. Cadilhac. Sep 73, 10p NASA-TT-F-14750
Contract NASW-2483
Tran-Transl. Into English from Opt. Commun. (Netherlands), V. 2, No. 5, Oct. 1970 p 235-238.

Descriptors: *Electromagnetic radiation, *Rayleigh equations, *Wave diffraction, Conductivity, Conformal mapping, Gratings (Spectra).

For abstract, see STAR 1213

N74-21807/4GA PC$4.00/MF$1.45
Helsinki Univ. of Technology, Otaniemi (Finland). Radio Lab.
PROGRESS IN RADIO SCIENCE IN FINLAND, 1972.
1973, 18p S-60

Descriptors: *Finland, *Microwaves, *Radio electronics, *Radio transmission, Electromagnetic noise, Frequency measurement, Ionosphere, Radio astronomy, Radio waves, Time measurement.

For abstract, see STAR 1213

N74-21856/1GA PC$5.25/MF$1.45
Ohio State Univ., Columbus. ElectroScience Lab.
RADIATION AND SCATTERING BY THIN-WIRE STRUCTURES IN THE COMPLEX FREQUENCY DOMAIN.
J. H. Richmond. May 74, 41p NASA-CR-2396, TR-2902-10
Contract NGL-36-008-138

Descriptors: *Antenna radiation patterns, *Electromagnetic radiation, *Scattering cross sections, Absorption cross sections, Current distribution, Galerkin method, Polarization characteristics.

For abstract, see STAR 1213

N74-22318/1GA PC$9.75/MF$1.45
Ohio State Univ., Columbus. ElectroScience Lab.
REACTION FORMULATION FOR RADIATION AND SCATTERING FROM PLATES, CORNER REFLECTORS AND DIELECTRIC-COATED CYLINDERS.
N. N. Wang. Apr 74, 135p NASA-CR-138175, ESL-2909-15
Contract NGL-36-008-138

Descriptors: *Cylindrical bodies, *Electromagnetic radiation, *Electromagnetic scattering, *Plates (Structural members), *Reaction kinetics, Computer programs, Dielectrics, Electric conductors, Electromagnetic fields.

For abstract, see STAR 1213

PB-232 746/8GA PC$5.75/MF$1.45
Texas Univ., Austin. Antennas and Propagation Lab.
EVALUATION OF A HOLLOW SPHERICAL CAVITY WITH A CIRCULAR APERTURE AS A REMOTE SENSOR OF ATMOSPHERIC INDEX OF REFRACTION,
J. D. Brett, and A. H. LaGrone. 31 May 73, 52p UTX-A/P-73-53

Descriptors: *Atmospheric refraction, *Refractive index, *Radio waves, Remote sensing, Cavity resonators, Wave equations, Spherical shells.

A theoretical and experimental investigations of a hollow spherical cavity with a circular aperture is made for the purpose of determining its usefulness as a remote sensor of atmospheric index of refraction. The theoretical study indicates that the idea is feasible, however, the band width of the cavity used in the experiment was too large to enable the measurement of the index of refraction to the accuracy desired. Thus, it appears that such a cavity is not a practical device, considering the state of the art, at the moment.

21. PROPULSION AND FUELS

21B. Combustion and Ignition

AD-780 615/1GA PC$5.25/MF$1.45
Cranfield Inst of Tech (England) School of Mechanical Engineering
AIDED COMBUSTION OF LIQUID AND GASEOUS FUELS INJECTED TRANSVERSELY INTO A SUPERSONIC AIR-STREAM.
Final scientific rept. 1 Jul 72-30 Jun 73,
Roy A. Cookson. Mar 74, 41p ARL-74-0098
Grant AF-AFOSR-2321-72

Descriptors: *Supersonic combustion, *Fuel injection, Flames, Stabilization, Stagnation temperature, Hydrogen, Methane, Kerosene, Combustion chambers, Great Britain, Supersonic flow, Jet flow.

An investigation has been made of the sustained combustion of transversely injected fuel jets in an enclosed Mach 2 air-stream. Hydrogen, methane and kerosene were employed as fuels. High-enthalpy test-air was supplied from a pebble-bed regenerative heat exchanger through a Mach 2 two-dimensional nozzle. The stagnation temperature of the test-air could be varied within wide limits, but for the studies reported here, had a maximum value of about 1800K. The favorable flame stabilization effect of the obstruction caused by a fuel jet injected transversely into the supersonic stream has been demonstrated. Two non-dimensional quantities have been proposed and have been shown to effectively describe the fluid dynamic effects associated with the flame stabilisation process. The two proposed non-dimensional quantities have been used in studying the effect of the interaction between the pilot and the main fuel injection configurations. (Modified author abstract)

AD-780 633/4GA PC$7.75/MF$1.45
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Engineering
ANALYSIS OF THE THERMAL RESPONSE OF A HYDRO-CARBON FUEL WHEN SUBJECTED TO A HIGH INTENSITY LASER.
Master's thesis,
Robert J. Skaar. Mar 74, 93p Rept no. GAW/MC/74-9

Descriptors: *Hydrocarbons, *Ignition, Computerized simulation, Fuels, Heat transfer, Vapors, Liquids, Theses, Walls, Heating, Aluminum, Titanium, Fuel tanks, Lasers.
Identifiers: *Laser heating.

An investigation was performed on laser-fuel interactions. The investigation included an analysis of laser ignition modes, ignition criteria, and the laser requirements for vapor ignition. The modes investigated were the wall heating mode for heating due to heat transfer from a laser irradiated plate and the direct heating mode for heating due to direct laser impingment on the fuel vapor. A computer programed mathematical model for one-dimensional heat transfer was used to determine the thermal response in a metal plate backed by liquid fuel or fuel vapor, and the fluid heating rate. Aluminum and titanium were considered. The investigation shows that in general, the laser has the capability of causing fuel fire or explosion. (Modified author abstract)

N74-22567/3GA PC$5.25/MF$1.45
Rocketdyne, Canoga Park, Calif.
ANALYSIS OF THE EFFECTS OF BAFFLES ON COMBUSTION INSTABILITY.
Final Report, Apr. 1971 - Mar. 1974.
C. L. Oberg, W. H. Evers, M. D. Schuman, and A. L. Huebner. May 74, 41p NASA-CR-134614, R-9480
Contract NAS3-11226

Descriptors: *Baffles, *Combustion physics, *Combustion stability, *Interior ballistics, *Propellant combustion, Computer programs, Numerical analysis, Performance prediction.

For abstract, see STAR 1213

N74-22571/5GA PC$12.25/MF$1.45
Tennessee Technological Univ., Cookeville. Dept. of Mechanical Engineering.

AN INVESTIGATION OF THE OPEN-LOOP AMPLIFICATION OF A REYNOLDS NUMBER DEPENDENT PROCESS BY WAVE DISTORTION.
Semiannual Status Report, Jun. - Dec. 1973.
M. B. Ventrice, and K. R. Purdy. May 74, 182p
NASA-CR-134620
Contract NGR-43-003-015

Descriptors: *Amplification, *Reynolds number, *Wave degradation, Acoustics, Anemometers, Combustion stability, Liquid propellant rocket engines, Nonlinearity, Performance prediction.

For abstract, see STAR 1213

N74-22572/3GA PC$6.50/MF$1.45
Southampton Univ. (England). Dept. of Aeronautics and Astronautics.
EQUATIONS OF TURBULENT COMBUSTION. PART 2: BOUNDARY LAYER APPROXIMATION.
K. N. C. Bray. Oct 73, 70p AASU-331
Contract SRC-B/RC/3552

Descriptors: *Boundary layer equations, *Combustion physics, *Premixed flames, *Turbulent flow, Differential equations, Flow equations, Kinetic energy, Mathematical models, Reaction time, Two dimensional flow.

For abstract, see STAR 1213

PB-233 037/1GA PC$5.25/MF$1.45
Bureau of Mines, Pittsburgh, Pa.
COMBUSTION CONTROL OF POLLUTANTS FROM MULTI-BURNER COAL-FIRED SYSTEMS.
Final rept.,
C. R. McCann, J. J. Demeter, R. B. Snedden, and D. Bienstock. May 74, 43p EPA-650/2-74-038

Descriptors: *Nitrogen oxides, *Combustion control, *Furnaces, *Coal, Pulverized fuels, Flue gases, Circulation, Combustion products.
Identifiers: *Air pollution control.

An experimental 500 lb/hr multi-burner pulverized-coal fired furnace was utilized to determine the effects of several combustion modifications on nitrogen oxides emissions. Techniques investigated were reduced excess air, staged combustion, flue gas recirculation to both primary and secondary combustion air streams, and combinations of all techniques. (Modified author abstract)

21C. Electric Propulsion

PAT-APPL-462 903 PC$4.00/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
APPARATUS FOR FORMING DISHED ION THRUSTER GRIDS.
Patent Application.
B. A. Banks. Filed 22 Apr 74, 11p NASA-CASE-LEW-11694-2,
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Forming techniques, *Grids, *Ion propulsion, *Metal working, Equipment specifications, *Patent applications, Product development.

The invention of an apparatus for forming matched pairs of dished grids having a high percentage of open areas for ion thruster accelerator systems is discussed. All the blanks and sheets are dished simultaneously by forcing fluid to inflate an elastic sheet which causes the desired degree of distortion. The dished grids are also stress relieved simultaneously. Diagrams of the forming device are provided.

21D. Fuels

AD-780 928/8GA PC$4.50/MF$1.45
Southwest Research Inst San Antonio Tex Army Fuels and Lubricants Research Lab
COMPREHENSIVE BIBLIOGRAPHY OF LITERATURE ON NONCRYOGENIC STORAGE AND RECOVERY OF HYDROGEN,
P. A. Kuntz, W. W. Wimer, W. D. Weatherford, Jr., and R. D. Quillian. Sep 73, 103p* Rept no. AFLRL-30
Contract DAAK02-73-C-0221

Descriptors: *Bibliographies, *Hydrogen, Hydrazine, Decomposition, Hydrides, Abstracts, Storage, Fuels, Chemisorption, Hydrocarbons, Ammonia, Gas generating systems, Metals, Biosynthesis, Production, Synthesis(Chemistry), Industrial production, Fuel cells.
Identifiers: *Fuel storage, Manufactured gas.

The chronological annotated bibliography has been compiled from the scientific literature for the noncryogenic storage of hydrogen for use as a fuel in a mobile vehicle. The bibliography covers a period of sixty-eight years (1905-1973) and is organized into two separate chronological bibliographies, each arising from different sources. These two primary sources are Chemical Abstracts and the Defense Documentation Center at Alexandria, Virginia. Topics covered include generation via decomposition and reaction of hydrides, metals, and other organic and inorganic compounds, biochemical generation, and various other storage means. (Modified author abstract)

AD-781 066/6GA PC$4.75/MF$1.45
Air Force Aero Propulsion Lab Wright-Patterson AFB Ohio
HIGH TEMPERATURE HYDROCARBON FUELS RESEARCH IN AN ADVANCED AIRCRAFT FUEL SYSTEM SIMULATOR ON FUEL AFFB-14-70.
Final rept. Jul 70-Sep 72,
Royce P. Bradley, Richard Bankhead, and Warren E. Bucher. Apr 74, 140p Rept no. AFAPL-TR-73-95
See also report dated Mar 70, AD-867 582.

Descriptors: *Kerosene, *Fuel systems, *Thermal stability, *Jet engine fuels, Aircraft equipment, Thermal stability, Manifolds(Engines), Deposits, Hydrocarbons, Flight simulators, Nozzles, Supersonic flight, Surfaces, Simulators, Heat exchangers, Oxygen, Solutions(Mixtures), Oxidation.
Identifiers: Dissolved oxygen.

Hydrocarbon fuels tend to form deposits in the thermal environment associated with high mach number flight. The Advanced Aircraft Fuel System Simulator provides thermal stability data on fuels which are used to determine aircraft fuel system design criteria, operational limits of fuels, and to aid in the development of small-scale thermal stability test devices. Fuel AFFB-14-70, the seventh fuel in a series, was tested under cyclic and steady-state conditions. Steady-state manifold tests were run to determine the effect of dissolved oxygen on thermal stability. The results of tests using manifold tubes with widely different surface finishes are reported. (Modified author abstract)

AD-781 164/9GA PC$6.75/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
THE PHYSICO-CHEMICAL PRINCIPLES OF THE FORMATION OF DEPOSITS IN JET FUELS,
G. F. Bolshakov. 9 Apr 74, 293p Rept no. FTD-MT-24-416-74
Edited machine trans. of mono. Fiziko-Khimicheskie Osnovy Obrazovaniya Osadkov v Reaktivnykh Toplivakh, n.p., 1972 p1-231, by Dean F. W. Koolbeck.

Descriptors: *Jet engine fuels, *Fuel contamination, Combustion deposits, Oxidation, Reaction kinetics, Hydrocarbons, Metals, Combustion products, Sulfur compounds, Alkanes, Cycloalkanes, Organic nitrogen compounds, Organic oxygen compounds, Translations, USSR.

Contents:
The formation of sediment in fuels which do not contain heteroorganic compounds;
The formation of sediment in fuels containing heteroorganic compounds;
Methods of obtaining prospective jet fuels.

N74-22603/6GA PC$5.75/MF$1.45
Georgia Inst. of Tech., Atlanta. Schools of Mechanical and Nuclear Engineering.
COMPARATIVE EVALUATION OF SOLAR, FISSION, FUSION, AND FOSSIL ENERGY RESOURCES. PART 4: ENERGY FROM FOSSIL FUELS.
Final Report.
J. R. Williams. 1974, 51p NASA-CR-138188
Contract NGR-11-002-166

Descriptors: *Energy consumption, *Energy conversion, *Energy policy, *Fossil fuels, Air pollution, Boilers, Coal gasification, Coal utilization, Demand (Economics), Electric power plants, Magnetohydrodynamic generators.

For abstract, see STAR 1213

ORNL-NSF-EP-68 PC$4.00/MF$1.45
Oak Ridge National Lab., Tenn. (Usa).
TOTAL ENERGY USE FOR COMMERCIAL AVIATION IN THE U.S.
E. Hirst. Apr 74, 15p
Contract W-7405-eng-26

Descriptors: (*Aircraft, *Total energy systems), Automobiles, Economics, Efficiency, Energy consumption, Energy source conservation, Industry, Maintenance, Transport, Usa, Variations.

For abstract, see NSA 30 01, number 02198.

21E. Jet and Gas Turbine Engines

AD-780 533/6GA PC$4.00/MF$1.45
Airesearch Mfg Co of Arizona Phoenix
SMALL TURBINE ENGINE NOISE REDUCTION. VOLUME I. EXECUTIVE SUMMARY.
Final rept. 7 May 71-31 May 73,
R. W. Heldenbrand, and R. N. Tedrick. Dec 73, 92p Rept no. 73-210285-1 AFAPL-TR-73-79-Vol-1
Contract F33615-71-C-1457
See also Volume 2, AD-780 573.

Descriptors: *Turboprop engines, *Turbofan engines, *Noise reduction, *Reconnaissance aircraft, Aerial reconnaissance, Combat surveillance, Low altitude, Jet engine noise, Attenuators.

The volume summarizes the technical objectives and desired end products. It also summarizes the results of the three test phases of the program and contains a brief discussion of contract documentation requirements and conclusions regarding the overall program results. (Author)

AD-780 534/4GA PC$3.75/MF$1.45
Airesearch Mfg Co of Arizona Phoenix
SMALL TURBINE ENGINE NOISE REDUCTION. VOLUME VI, PART II. DUCT DESIGN AND ATTENUATION PROGRAM USER'S MANUAL.
Final rept. 7 May 71-31 May 73,
W. M. Gipson, and B. M. Goodman. Dec 73, 59p Rept no. 73-210285-6-Pt-2 AFAPL-TR-73-79-Vol-6-Pt-2
Contract F33615-71-C-1457
See also Part 1, AD-780 577 and Volume 1, AD-780 533.

Descriptors: *Turboprop engines, *Turbofan engines, *Noise reduction, *Reconnaissance aircraft, *Computer programs, Aerial reconnais-

sance, Combat surveillance, Low altitude, Jet engine noise, Attenuators, FORTRAN.
Identifiers: DUCTEC computer program, DUCOPT computer program, CDC 6400 computers.

Vol. 6, Part 2, presents a computational package that designs attenuated duct systems for achieving predetermined attenuation increments or predicts those increments for previously determined duct and attenuator configurations. Two basic approaches have been used in this task--one entirely empirical in its development, and the other theoretically based. (Author)

AD-780 573/2GA PC$8.25/MF$1.45
Airesearch Mfg Co of Arizona Phoenix
SMALL TURBINE ENGINE NOISE REDUCTION. VOLUME II. NOISE PREDICTION METHODS.
Final rept. 7 May 71-31 May 73,
E. Grande, D. Brown, L. Sutherland, and Richard N. Tedrick. Dec 73, 377p Rept no. 73-210285-2 AFAPL-TR-73-79-Vol-2
Contract F33615-71-C-1457
See also Volume 1, AD-780 533 and Volume 3, AD-780 574.

Descriptors: *Turboprop engines, *Turbofan engines, *Noise reduction, *Reconnaissance aircraft, Aerial reconnaissance, Combat surveillance, Low altitude, Jet engine noise, Attenuators.

The volume presents reviews of many currently available methods for predicting small gas turbine noise source characteristics involving those developed, adopted, or modified. A total engine noise prediction methodology using those component noise prediction techniques shown to be the most practical and reliable for small gas turbine engines is also presented. (Author)

AD-780 574/0GA PC$4.75/MF$1.45
Airesearch Mfg Co of Arizona Phoenix
SMALL TURBINE ENGINE NOISE REDUCTION. VOLUME III. SUPPRESSION DESIGN AND PREDICTION METHODOLOGY/MATERIALS TESTS.
Final rept. 7 May 71-31 May 73,
W. M. Gipson, and R. N. Tedrick. Dec 73, 149p Rept no. 73-210285-3 AFAPL-TR-73-79-Vol-3
Contract F33615-71-C-1457
See also Volume 2, AD-780 573 and Volume 4, AD-780 575.

Descriptors: *Turboprop engines, *Turbofan engines, *Noise reduction, *Reconnaissance aircraft, Aerial reconnaissance, Combat surveillance, Low altitude, Jet engine noise, Attenuators.

The volume reviews the published theoretical background from a number of sources to present a uniform approach to duct and lining sound-attenuation prediction. It further reviews the results of a wide variety of acoustical tests of lining materials and configurations. The final development of an applicable technology for small gas turbine duct attenuator design and attenuation prediction is included, along with comparison to actual turbopropulsion duct test data. (Author)

AD-780 575/7GA PC$6.00/MF$1.45
Airesearch Mfg Co of Arizona Phoenix
SMALL TURBINE ENGINE NOISE REDUCTION. VOLUME IV. TURBOPROP ENGINE DEMONSTRATION TESTS.
Final rept. 7 May 71-31 May 73,
W. M. Gibson, R. W. Heldenbrand, and Richard N. Tedrick. Dec 73, 232p Rept no. 73-210285-4 AFAPL-TR-73-79-Vol-4
Contract F33615-71-C-1457
See also Volume 3, AD-780 574 and Volume 5, AD-780 576.

Descriptors: *Turboprop engines, *Turbofan engines, *Noise reduction, *Reconnaissance aircraft, Aerial reconnaissance, Combat surveillance, Low altitude, Jet engine noise, Attenuation.

The volume describes the full-scale engine test program and presents selected data with results of the engine noise reduction development. Engine testing was accomplished to provide experimental verification of engine noise prediction and suppression techniques established in the preceding volumes. (Author)

AD-780 576/5GA PC$8.00/MF$1.45
Airesearch Mfg Co of Arizona Phoenix
SMALL TURBINE ENGINE NOISE REDUCTION. VOLUME V. DATA TABULATIONS.
Final rept. 7 May 71-31 May 73,
Richard N. Tedrick, and George T. Kantarges.
Dec 73, 359p Rept no. 73-210285-5 AFAPL-TR-73-79-Vol-5
Contract F33615-71-C-1457
See also Volume 4, AD-780 575 and Volume 6 Part 1, AD-780 577.

Descriptors: *Turboprop engines, *Turbofan engines, *Noise reduction, *Reconnaissance aircraft, Aerial reconnaissance, Combat surveillance, Low altitude, Jet engine noise, Attenuators.

Volume 5 of AFAPL-TR-73-79 contains tabulations of the measured engine data developed under the Small Turbine Engine Noise Reduction Study. The data is presented as tabulated listings of the one-third octave band sound pressure level for each engine configuration, each engine load point, and at each microphone position. Sound power level tabulations have also been included, to allow comparison of the effectiveness of the various hardware configurations on the basis of the sound power level. This volume also contains the impedance and acoustic absorption data sheets for those materials and material constructions not reported in Volume 3. In addition, the complete tabulated data from the standing wave (impedance) tube apparatus material tests is presented. (Modified author abstract)

AD-780 577/3GA PC$5.00/MF$1.45
Airesearch Mfg Co of Arizona Phoenix
SMALL TURBINE ENGINE NOISE REDUCTION. VOLUME VI, PART I. NOISE PREDICTION PROGRAM USER'S MANUAL.
Final rept. 7 May 71-31 May 73,
W. M. Gipson, B. M. Goodman, and P. Y. Ho. Dec 73, 170p Rept no. 73-210285-6-Pt-1 AFAPL-TR-73-79-Vol-6-Pt-1
Contract F33615-71-C-1457
See also Part 2, AD-780 534 and Vol. 5, AD-780 576.

Descriptors: *Turboprop engines, *Turbofan engines, *Noise reduction, *Reconnaissance aircraft, *Computer programs, Aerial reconnaissance, Combat surveillance, Low altitude, Jet engine noise, Attenuators, FORTRAN.
Identifiers: GEAR computer program, NOISE computer program, CDC 6400 computers.

Vol. 6, Part I, calculates the bare-engine noise signature and typical flyover sound levels of small, installed, aircraft turbopropulsion engines. Techniques were employed or adapted to accurately predict the radiated acoustic signature (during either static test or aircraft flyover) of turboprop and turbofan propulsion systems in the 80- to 1000-shaft-horsepower class for turboprops and in the 400- to 5000-pound-thrust class for turbofans. In order to adequately predict the flyover noise signature of such an engine, it was first necessary to predict the contributions to that signature from each component. Garrett AiResearch and their subcontractor, Wyle Laboratories, Inc., cooperatively evaluated published prediction methods for each source, using measuring small-engine noise data. (Author)

AD-780 636/7GA PC$4.00/MF$1.45
Rand Corp Santa Monica Calif
RELATING TECHNOLOGY TO ACQUISITION COSTS. AIRCRAFT TURBINE ENGINES,
J. R. Nelson, and F. S. Timson. Mar 74, 81p Rept no. R-1288-PR
Contract F44620-73-C-0011

Descriptors: *Aircraft engines, *Logistics planning, Cost analysis, Procurement, Estimates, Mathematical models, Turbofan engines, Turbojet engines, Thrust, Fuel consumption.
Identifiers: Cost models, Logistics management.

The quantitative measure presented in the report is derived from a recent Rand study in which a technique was developed for assessing the date at which an aircraft turbine engine with a specified set of technical parameters should pass its 150-hr Model Qualification Test (MQT). The refined aircraft turbine engine TOA model is based on 26 U.S. military turbojet and turbofan engines developed and produced during the past 30 years. The model predicts the man-rated 150-hr MQT date as a function of certain of the engine's performance and design parameters. The parameters include maximum thrust of the engine at sea-level static conditions, weight, specific fuel consumption at military thrust at sea-level static, turbine inlet temperature, and a pressure term (the product of flight envelope maximum dynamic pressure and the overall pressure ratio of the engine). (Modified author abstract)

AD-780 958/5GA PC$3.25/MF$1.45
National Aviation Facilities Experimental Center Atlantic City N J
COMPARISON OF EXHAUST EMISSIONS OF A LOW-TIME JT8D-11 ENGINE: HIGH-SMOKE VERSUS LOW-SMOKE COMBUSTION CHAMBER CONFIGURATIONS.
Final rept. Jul 72-Dec 73,
Stephen L. Imbrogno, and Thomas Rust, Jr. Apr 74, 30p Rept no. FAA-NA-74-6 FAA-RD-74-87

Descriptors: *Smoke, *Combustion chambers, *Turbofan engines, Jet engines, Carbon monoxide, Hydrocarbons, Nitrogen oxides.
Identifiers: JT8D engines.

Engine-core exhaust emissions were measured on a low-time JT8D-11 engine in both high-smoke and low-smoke configurations. Changing from the high-smoke to the low-smoke configuration considerably reduced the visible smoke, 55 to 90 percent, as measured using the Society of Automotive Engineers (SAE) smoke number. Carbon monoxide was reduced by up to 40 percent. Total unburned hydrocarbons were reduced by 40 percent at idle power, while the production of oxides of nitrogen was increased by 60 percent at the high power setting. These percentages are absolute with no consideration for time in mode, according to the Environmental Protection Agency (EPA) landing/takeoff cycle. (Author)

AD-781 006/2GA PC$11.50/MF$1.45
Teledyne Cae Toledo Ohio
LIFT ENGINE ADVANCED TURBINE BLADE TECHNOLOGY.
Final rept. 14 Jul 72-24 Mar 73.
Apr 73, 169p Rept no. TCAE-1285
Contract N00140-73-C-0075

Descriptors: *Vertical takeoff aircraft, *Jet engines, *Turbine blades, Rotor blades(Turbomachinery), Cooling, Effusion, Composite materials, Diffusion bonding, Experimental design.
Identifiers: *Effusion cooling, Direct lift engines, Nickel alloy Nichrome 5.

The objective of the program was to demonstrate the capability for a significant improvement in lift engine thrust-to-weight through an improvement in the turbine rotor blade design. The design was directed at a reduction in turbine weight coupled with an efficient blade cooling system which would reduce cooling bleed flow and provide a potential for increasing turbine inlet temperature. The approach combines the efficiency of an effusion-cooled system with a unique structural design which greatly reduces turbine blade weight. The blade shell design consists of an outer porous skin

formed through diffusion bonded layers of Nichrome V screening material, a grid (plenum) plate which distributes air to the porous outer skin, and an orifice plate which controls the flow to the grid plate plenums. The orifice plate also acts as the primary structural member of the blade, avoiding the more common requirement for a central spar. (Modified author abstract)

JPRS-62029 PC$3.00/MF$1.45
Joint Publications Research Service, Arlington, Va.
GAS TURBINES TODAY AND TOMORROW,
V. Uvarov. 17 May 74, 25p
Trans. of Nauka i Zhizn (USSR) n3 p78-87 1974.

Descriptors: *Gas turbines, Ship turbines, Jet engines, Gas turbine engines, Turbogenerators, Translations, USSR.The report contains a description of the basic problems in developing gas turbines.

The report contains a description of the basic problems in developing gas turbines.

N74-21652/4GA PC$3.25/MF$1.45
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
COMPARISON OF ACOUSTIC PERFORMANCE OF FIVE MUFFLER CONFIGURATIONS ON A SMALL HELICOPTER.
R. J. Pegg, and D. A. Hilton. May 74, 37p NASA-TN-D-7495, L-8990

Descriptors: *Acoustic measurements, *Bell aircraft, *Engine noise, *Exhaust gases, *Helicopters, *Noise reduction, Acoustic properties, Aircraft equipment, Equipment specifications, Mufflers.

For abstract, see STAR 1213

N74-22405/6GA PC$19.00/MF$1.45
Garrett Corp., Los Angeles, Calif.
HIGH-TIP-SPEED, LOW-LOADING TRANSONIC FAN STAGE. PART 2: DATA COMPILATION.
T. C. Ware, R. J. Kobayashi, and R. J. Jackson.
Feb 74, 319p NASA-CR-121262, AIRESEARCH-73-9487-PT-2
Contract NAS3-13498

Descriptors: *Air flow, *Flow characteristics, *Transonic flow, *Turbofan engines, Data acquisition, Engine tests, Inlet flow, Performance tests.

For abstract, see STAR 1213

N74-22406/4GA PC$13.25/MF$1.45
Garrett Corp., Los Angeles, Calif.
HIGH-TIP-SPEED, LOW-LOADING TRANSONIC FAN STAGE. PART 3: FINAL REPORT.
T. C. Ware, R. J. Kobayashi, and R. J. Jackson.
Feb 74, 202p NASA-CR-121263, AIRESEARCH-73-9488-PT-3
Contract NAS3-13498

Descriptors: *Air flow, *Flow characteristics, *Transonic flow, *Turbofan engines, Data acquisition, Engine tests, Inlet flow, Performance tests.

For abstract, see STAR 1213

N74-22408/0GA PC$13.75/MF$1.45
General Electric Co., Evendale, Ohio. Aircraft Engine Group.
NASA/GE QUIET ENGINE C ACOUSTIC TEST RESULTS.
S. B. Kazin, and J. E. Pass. Apr 74, 215p NASA-CR-121176, R73AEG364
Contract NAS3-12430

Descriptors: *Engine noise, *Noise reduction, *Quiet engine program, *Turbofan engines, Acoustic measurements, Acoustic properties, Engine design, Engine tests.

For abstract, see STAR 1213

N74-22412/2GA PC$12.75/MF$1.45
Hamilton Standard, Windsor Locks, Conn.
FREQUENCY OF SUPERSONIC INLET UNSTARTS DUE TO ATMOSPHERIC TURBULENCE.
Final Report.
F. W. Barry. Oct 73, 191p NASA-CR-137482, HSER-5838
Contract NAS2-4515

Descriptors: *Atmospheric turbulence, *Firing (Igniting), *Inlet flow, *Jet engines, *Propulsion system performance, Data processing, Engine tests, Numerical analysis, Power spectra.

For abstract, see STAR 1213

N74-22413/0GA PC$4.75/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
HYDES: A GENERALIZED HYBRID COMPUTER PROGRAM FOR STUDYING TURBOJET OR TURBOFAN ENGINE DYNAMICS.
J. R. Szuch. Apr 74, 135p NASA-TM-X-3014, E-7316

Descriptors: *Computerized simulation, *Propulsion system performance, *Turbofan engines, *Turbojet engines, Computer programs, Performance prediction, Systems engineering.

For abstract, see STAR 1213

N74-22416/3GA PC$4.75/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
INVESTIGATION OF NOISE FROM FULL-SCALE HIGH BYPASS ENGINE AND BLOWN FLAP SYSTEM.
W. L. Jones, and L. J. Heidelberg. 1974, 31p NASA-TM-X-71539, E-7946
Conf-Presented at Air Transport Meeting, Dallas, 30 Apr. - 2 May 1974; Sponsored by Sae.

Descriptors: *Aircraft engines, *Aircraft noise, *Externally blown flaps, *Noise reduction, Aerodynamic configurations, Flaps (Control surfaces), Nozzle flow, Scale models, Short takeoff aircraft.

For abstract, see STAR 1213

N74-22566/5GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
MEASUREMENT OF GASEOUS EMISSIONS FROM A TURBOFAN ENGINE AT SIMULATED ALTITUDE CONDITIONS.
L. A. Diehl, and J. A. Biaglow. Apr 74, 22p NASA-TM-X-3046, E-7821

Descriptors: *Air pollution, *Aircraft engines, *Exhaust gases, *Fuel-air ratio, *Turbofan engines, Carbon monoxide, Combustion physics, Combustion products, Nitrogen oxides.

For abstract, see STAR 1213

PATENT-3 791 759 Not available NTIS
Department of the Air Force Washington D C
TURBINE PRESSURE ATTENUATION PLENUM CHAMBERS.
Patent,
Joseph A. Tetrault. Filed 7 Jun 72, patented 12 Feb 74, 3p Rept nos. PAT-APPL-260 645,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Gas turbines, *Chambers, *Patents, Distribution, Pressure.

Identifiers: PAT-CL-415-119, *Plenum chambers.

The patent relates to a turbine having a plurality of pressure attenuation plenum chambers. These chambers are located adjacent the vanes of a turbine thereby relieving the excess pressure by distributing it through a series of apertures in the plenum chamber walls.

21H. Rocket Motors and Engines

AD-780 531/0GA PC$5.50/MF$1.45
United Technology Center Sunnyvale Calif
HIGH CHAMBER PRESSURE BLAST TUBE AND NOZZLE MATERIAL EVALUATION. VOLUME I.
Final rept. Apr 71-Jul 73,
Wendell A. Stephen. 17 Jun 74, 179p Rept no. UTC-2410-FR-Vol 1 AFRPL-TR-73-60-Vol-1
Contract F04611-71-C-0051
See also Volume 2, AD-780 532.

Descriptors: *Solid propellant rocket engines, *Rocket nozzles, *Blast tubes, *Nozzle throats, Ablative materials, Corrosion, Combustion chambers, Rocket propellant grains, Solid rocket propellants, Thermal analysis, Carbon phenolic materials, Captive tests, Guided missiles, Air launched.

The objectives were to evaluate the effects of propellant corrosivity and blast tube contraction ratio on candidate nozzle materials in high chamber pressure rocket motor environments (3,000 and 3,500 psia). A total of 16 lightweight aft closures and nozzles were designed, fabricated, and test fired. High velocity blast tubes with contraction ratios of 2.0 and 1.3, respectively, were used on all nozzles. The effects of propellant flame temperature and corrosivity were evaluated by testing with both 18% and 5% aluminized, 88% solids loaded CTPB propellants. The effects of both cylindrical and keyhole port grain configurations also were evaluated. Conventional state-of-the-art phenolic, elastomeric, graphite materials were used. (Modified author abstract)

AD-780 532/8GA PC$5.50/MF$1.45
United Technology Center Sunnyvale Calif
HIGH CHAMBER PRESSURE BLAST TUBE AND NOZZLE MATERIAL EVALUATION. VOLUME II.
Final rept.,
Wendell A. Stephen, T. E. Frakes, and T. V. O'Hara. 17 Jun 74, 198p Rept no. UTC-2410-FR-Vol-2 AFRPL-TR-73-60-Vol-2
Contract F04611-71-C-0051
See also Volume 1, AD-780 531.

Descriptors: *Solid propellant rocket engines, *Rocket nozzles, *Blast tubes, *Nozzle throats, Ablative materials, Computer applications, Heat flux, Convection(Heat transfer), Thermal radiation, Solid rocket propellants, Combustion chambers, Carbon phenolic materials, Air launched, Guided missiles.
Identifiers: ACE computer program, CMA computer program, ARGEIBL computer program.

The set of Aerotherm computer programs (ACE, CMA, ARGEIBL) which were validated for charring ablating and carbon/carbon materials in conventional and low velocity blast tube nozzles were validated for these same materials for high velocity blast tube nozzles, operation at high chamber pressures (up to 3000 psia), and aluminized CTPB propellants which vary in aluminum content from 5 to 18 percent. The validation was determined based on comparisons between measured and predicted surface recession and char depth thickness and between predicted and determined convective heat transfer coefficients. In general, the agreement between the analytical predictions and the surface recession and char depth data was within the experimental accuracy of the measurements with the exception of the throat. The best agreement was obtained for the analysis locations in the blast tube

and exit cone. The poorest agreement occured for the pyrolytic graphite washers in the nozzle throat region. (Modified author abstract)

AD-780 642/5GA PC$9.25/MF$1.45
United Technology Center Sunnyvale Calif
CASE LINER BOND ANALYSIS.
Final rept. 15 Nov 71-21 Jun 74,
E. C. Francis, L. I. Deverall, C. H. Carlton, H. J. Zitzer, and W. G. Knauss. Jul 74, 470p Rept no. UTC-2439-FR AFRPL-TR-74-23
Contract F04611-72-C-0010

Descriptors: *Solid propellant rocket engines, *Rocket engine cases, *Computer programs, Bonding, Stresses, Cracking(Fracturing), Crack propagation, Interfaces.
Identifiers: Finite element analysis, Brittle fracture, TEXGAP computer code.

A second generation finite element computer code was developed with specialized features for accurate evaluation of solid propellant case liner bond regions. The code uses six-term quadratic elements for propellant modeling, special thin liner elements for liner and insulation modeling, and a crack tip element for modeling boots and cracked regions. Mesh generation is automated with variable density spacing and input format is optimized for minimum labor during problem setup. The code contains a rezone feature for selective refining of specific high stress gradient regions and rerunning for maximum accuracy. This new computer code was made available to the solid propellant industry at a computer users course in October 1973. (Modified author abstract)

AD-780 834/8GA PC$9.25/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
SOLID-PROPELLANT ROCKET ENGINES,
A. M. Vinitskii. 9 Apr 74, 454p Rept no. FTD-MT-24-328-74
Edited machine trans. of mono. Raketnye Dvigateli na Tverdom Toplive, Moscow, 1973 p1-348, by Robert Allen Potts.

Descriptors: *Solid propellant rocket engines, Translations, Equations of motion, Combustion chambers, Combustion products, Solid rocket propellants, Rocket nozzles, Thrust, Interior ballistics, Gas dynamics, USSR.

The book describes the motion of combustion products in the chamber and nozzle of solid-propellant rocket engine. The spreads of intrachamber and output characteristics of RDTT, caused by random and systematic deviations of the loading parameters are analyzed. The effect of the engine and propellant characteristics on the ideal velocity of the rocket is also analyzed. The book also examines the procedure for profiling of nozzles, the motion of two-phase combustion products, and the calculation and design of charges from solid rocket propellants.

N74-22401/5GA PC$24.00/MF$1.45
Rocketdyne, Canoga Park, Calif.
SPACE SHUTTLE APS PROPELLANT THERMAL CONDITIONER STUDY.
Final Report.
D. L. Fulton. May 73, 418p NASA-CR-134242, R-9167
Contract NAS9-12046

Descriptors: *Auxiliary propulsion, *Space shuttles, Hydrogen oxygen engines, Space shuttle boosters, Space shuttle orbiters, Systems engineering.

For abstract, see STAR 1213

N74-22411/4GA PC$13.50/MF$1.45
Kanner (Leo) Associates, Redwood City, Calif.
DEVELOPMENT OF RUSSIAN ROCKET ENGINE TECHNOLOGY.
Y. K. Moshkin. Mar 74, 208p NASA-TT-F-15408
Contract NASW-2481
Tran-Transl. Into English of the Book "Razvitiye Otechestvennogo Raketnogo Dvigatelestroyeniya" Moscow, Mashinostroyeniye Press, 1973 256 p.

Descriptors: *Engine design, *Liquid propellant rocket engines, Multistage rocket vehicles, Systems analysis, Technology assessment, U.s.s.r..

For abstract, see STAR 1213

N74-22415/5GA PC$12.50/MF$1.45
Rocketdyne, Canoga Park, Calif.
TANK 12 DATA DUMP OME INTEGRATED THRUST CHAMBER TEST REPORT, PHASE 1.
Space Shuttle Orbit Maneuvering Engine Reusable Thrust Chamber Program.
R. P. Pauckert, and R. D. Tobin. 9 Apr 74, 190p NASA-CR-134256, ASR74-117
Contract NAS9-12802

Descriptors: *Performance tests, *Thrust chambers, Fuel injection, Heat transfer, Regenerative cooling, Temperature effects, Wall temperature.

For abstract, see STAR 1213

21I. Rocket Propellants

AD-780 638/3GA PC$4.75/MF$1.45
Urs Research Co San Mateo Calif
BLAST HAZARDS OF THE LIQUID PROPELLANTS LCO AND LN20.
Final rept.,
Chuck Wilton, and A. B. Willoughby. Jan 74, 150p Rept no. URS-7309-12 AFRPL-TR-74-7
Contract F04611-73-C-0053

Descriptors: *Liquid propellants, *Liquefied gases, *Blast, Hazards, Nitrogen oxides, Nitroso compounds, Carbon monoxide, Explosions, Test methods.

A limited test program was conducted to obtain preliminary explosive yield data for the propellant combination of liquid carbon monoxide and liquid nitrous oxide, under conditions which simulate credible failure in a future test facility. During the course of the program ten tests were conducted using mixtures of these propellants in both liquid and gas phases and another five tests were conducted using mixtures of liquid of gaseous carbon monoxide and air. Propellant weights ranged from about 50 to 800 lbs. (Modified author abstract)

AD-780 641/7GA PC$3.75/MF$1.45
Rockwell International Corp Mcgregor Tex Rocketdyne Div
MINUTEMAN STV DATA REDUCTION.
Final rept. 1 Dec 71-10 Sep 73,
John D. Burton, and William H. Miller. Feb 74, 65p AFRPL-TR-73-113
Contract F04611-72-C-0028

Descriptors: *Surface to surface missiles, *Solid propellant rocket engines, *Solid rocket propellants, Bonding, Stress strain relations, Stress testing, Loads(Forces), Transducers, Data reduction.
Identifiers: Structural test vehicles, Minuteman.

A solid propellant rocket motor (First State Minuteman) was instrumented to record bond line stresses and inner bore strains. The motor was subjected to a variety of thermal and mechanical loads over a two-year period. Feasibility of instrumenting motors in the field was demonstrated and stress and strain data were reduced for the various loads. The reported results raise some questions regarding gage consistency but useful data were obtained. (Modified author abstract)

AD-780 967/6GA PC$3.00/MF$1.45
Stevens Inst of Tech Hoboken N J Dept of Mechanical Engineering
EXPERIMENTAL STUDY OF THE COMPOSITE SOLID PROPELLANT DEFLAGRATION PROCESS ON A FUNDAMENTAL LEVEL.
Final rept. 15 Nov 72-15 Sep 73,
Robert F. McAlevy, III, and Richard B. Cole. Dec 73, 8p Rept no. ME-RT-73006
Contract N00014-67-A-0202-0035
Continuation of Contract N00014-67-A-0202-0023.

Descriptors: *Solid rocket propellants, *Composite propellants, *Deflagration, Ammonium perchlorate, Oxidizers, Catalysis, Pyrolysis, Reaction kinetics.

Two efforts are reported as a continuation and termination of previous work: (1) modelling of the deflagration of ammonium-perchlorate(AP)-oxidized composite solid propellants, (2) measurements of linear-pyrolysis rates of pure and catalyzed AP. Modeling efforts led to development of a new comprehensive model of AP composite propellant burning. The model is termed the 'modified granular-diffusion-flame model'. Linear pyrolysis experiments corroborated earlier data by another experimenter. New pyrolysis-rate measurements were made with catalyzed AP and with different radiometric wavelengths for surface-temperature measurement. Interpretation of these results was cut short by program termination. (Author)

AD-781 128/4GA PC$4.00/MF$1.45
Rockwell International Corp Mcgregor Tex Rocketdyne Div
MULTIPLE-FLAME COMBUSTION MODEL FORTRAN IV COMPUTER PROGRAM.
Final rept.,
G. D. Sammons, D. K. Barrington, and C. H. Burnside. 8 Mar 74, 90p Rept no. R-4827 AFOSR-TR-74-0985
Contract F44620-72-C-0046

Descriptors: *Combustion, *Solid rocket propellants, *Computer programs, Burning rate, FORTRAN, Mathematical models.
Identifiers: FORTRAN 4 programming language, NRCOMB computer program, IBM 360 computers.

Several investigators have formulated competing-flame models describing composite solid propellant combustion. This report covers Mr. G. D. Sammons' competing-flame modeling efforts. His papers describing the model are appended. This report describes and lists the FORTRAN IV computer program which is the practical outcome of any modeling effort. Included is the solution of an example problem--estimation of the burning rate of a low-smoke HTPB propellant. How the necessary input values are obtained and how they are input is discussed in detail. Finally, the computer solution printout is depicted. (Modified author abstract)

22. SPACE TECHNOLOGY

22A. Astronautics

N74-21801/7GA PC$17.50/MF$1.45
Santa Barbara Research Center, Goleta, Calif.
STUDY OF SPIN-SCAN IMAGING FOR OUTER PLANETS MISSIONS.
Final Technical Report.
E. E. Russell, R. A. Chandos, J. C. Kodak, S. F. Pellicori, and M. G. Tomasko. 27 Feb 74, 289p NASA-CR-114745
Contract NAS2-7096

Descriptors: *Imaging techniques, *Jupiter probes, *Mission planning, *Multispectral band scanners, *Spectroradiometers, Outer planets explorers, Sequencing, Spaceborne photography, Spacecraft instruments.

For abstract, see STAR 1213

N74-22106/0GA PC$4.00/MF$1.45
Santa Barbara Research Center, Goleta, Calif.
STUDY OF SPIN-SCAN IMAGING FOR OUTER PLANETS MISSIONS: EXECUTIVE SUMMARY.
Final Report.
E. E. Russell, R. A. Chandos, J. C. Kodak, S. F. Pellicori, and M. G. Tomasko. 27 Feb 74, 17p
NASA-CR-114746
Contract NAS2-7096

Descriptors: *Imaging techniques, *Infrared detectors, *Pioneer 10 space probe, *Remote sensors, *Scanners, Optical data processing, Optical equipment, Space exploration, Space missions.

For abstract, see STAR 1213

N74-22443/7GA PC$4.00/MF$1.45
Scientific Translation Service, Santa Barbara, Calif.
THE SOVIET-AMERICAN SPACE EXPERIMENT.
K. D. Bushuyev. Apr 74, 16p NASA-TT-F-15502
Contract NASW-2483
Tran-Transl. Into English from Vestn. Akad. Nauk Sssr (Moscow), No. 1, 1974 p 59-66.

Descriptors: *Apollo soyuz test project, *Spacecraft design, Life support systems, Spacecraft docking, Transfer orbits.

For abstract, see STAR 1213

N74-22444/5GA PC$4.50/MF$1.45
Scientific Translation Service, Santa Barbara, Calif.
LUNOKHOD-2 ON THE LUNAR CONTINENT.
A. A. Gurshteyn. Apr 74, 27p NASA-TT-F-15401
Contract NASW-2483
Tran-Transl. Into English from Priroda (Ussr), No. 10, Oct. 1973 p 17-26.

Descriptors: *Lunokhod lunar roving vehicles, *Space missions, *Spacecraft performance, *U.s.s.r. space program, Lunar crust, Lunar exploration, Research projects.

For abstract, see STAR 1213

N74-22473/4GA PC$6.50/MF$1.45
Alaska Univ., College.
ACTIVE EXPERIMENTS IN SPACE IN CONJUNCTION WITH SKYLAB.
Final Report.
E. M. Wescott. May 74, 67p NASA-CR-138164
Contract NGR-02-001-088

Descriptors: *Barium, *Magnetic storms, *Plasma jets, *Space charge, Alaska, Auroras, Current sheets, Data reduction, Payloads, Skylab program.

For abstract, see STAR 1213

N74-22474/2GA PC$5.75/MF$1.45
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
RETENTION AND APPLICATION OF SKYLAB EXPERIMENT EXPERIENCES TO FUTURE PROGRAMS.
N. Milly, and V. G. Gillespie. 1 May 74, 53p
NASA-TM-X-64839

Descriptors: *Failure analysis, *Reliability engineering, *Skylab program, Man machine systems, Mission planning, Spacecraft design, Technology utilization.

For abstract, see STAR 1213

N74-22476/7GA PC$9.50/MF$1.45
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
RECOMMENDED RADIATIVE PROPERTY DATA FOR VENUSIAN ENTRY CALCULATIONS.
J. J. Jones, R. E. Boughner, K. V. Haggard, J. E. Nealy, and D. R. Schryer. May 74, 130p NASA-TM-X-71961

Descriptors: *Atmospheric entry, *Atmospheric radiation, *Venus atmosphere, Atmospheric optics, Carbon dioxide, Electron scattering, Molecular oscillators, Opacity, Shock layers.

For abstract, see STAR 1213

N74-22480/9GA PC$3.25/MF$1.45
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
SKYLAB 3 AND 4 SCIENCE DEMONSTRATIONS: PRELIMINARY REPORT.
T. C. Bannister. May 74, 32p NASA-TM-X-64835

Descriptors: *Experimentation, *Skylab 3, *Skylab 4, Charged particles, Crystal growth, Diffusion, Fluid mechanics, Gyroscopes, Ice, Liquid-liquid interfaces, Orbital mechanics, Solubility.

For abstract, see STAR 1213

N74-22494/0GA PC$6.50/MF$1.45
Aerospace Corp., El Segundo, Calif. Systems Planning Div.
PROGRAMMATIC EFFECTS OF UTILIZING VARIOUS SPACE TUG OPTIONS.
Study 2.6 Interim Report.
L. T. Stricker. Jul 73, 66p NASA-CR-138141, ATR-74(7336)-2
Contract NASW-2472

Descriptors: *Payloads, *Space transportation, *Space tugs, Mission planning, Space shuttles, Spacecraft configurations.

For abstract, see STAR 1213

N74-22497/3GA PC$8.25/MF$1.45
Virginia Polytechnic Inst. and State Univ., Blacksburg. Dept. of Engineering Science and Mechanics.
THE STABILITY OF MOTION SATELLITES WITH LONG FLEXIBLE APPENDAGES.
Final Technical Report.
L. Meirovitch. Mar 74, 101p NASA-CR-138153
Contract NGR-47-004-098

Descriptors: *Gravity gradient satellites, *Motion stability, Differential equations, Liapunov functions, Nonlinear equations.

For abstract, see STAR 1213

N74-22501/2GA PC$9.75/MF$1.45
Howard Univ., Washington, D.C. Dept. of Mechanical Engineering.
THE THREE DIMENSIONAL MOTION AND STABILITY OF A ROTATING SPACE STATION: CABLE-COUNTERWEIGHT CONFIGURATION.
Final Report.
P. M. Bainum, and K. S. Evans. May 74, 134p
NASA-CR-138151
Contract NGR-09-011-053

Descriptors: *Cables (Ropes), *Space stations, *Spacecraft configurations, *Spacecraft stability, Equations of motion, Numerical analysis, Performance prediction.

For abstract, see STAR 1213

N74-22507/9GA PC$3.25/MF$1.45
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
REMOVAL OF SPACECRAFT-SURFACE PARTICULATE CONTAMINANTS BY SIMULATED MICROMETEOROID IMPACTS.
J. H. Goad, Jr., J. D. Dibattista, D. M. Robinson, and W. P. Chu. May 74, 27p NASA-TN-D-7494, L-9269

Descriptors: *Hypervelocity impact, *Micrometeoroids, *Space environment simulation, *Spacecraft contamination, Holography, Mathematical models, Particle accelerators, Velocity distribution.

For abstract, see STAR 1213

N74-22509/5GA PC$3.75/MF$1.45
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
SSME/SIDE LOADS ANALYSIS FOR FLIGHT CONFIGURATION.
W. Holland, and J. Harbison. 18 Feb 74, 62p
NASA-TM-X-64841

Descriptors: *Loads (Forces), *Propulsion system performance, *Space shuttles, *Statistical analysis, Boundary layer separation, Dynamic response, Monte carlo method, Separated flow.

For abstract, see STAR 1213

N74-22510/3GA PC$5.75/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
CENTAUR STANDARD SHROUD (CSS) FULL JETTISON TEST DYNAMIC ANALYSIS.
H. J. Kasper, and R. M. Donovan. Apr 74, 53p
NASA-TM-X-71537, E-7943

Descriptors: *Centaur launch vehicle, *Dynamic tests, *Jettisoning, *Shrouds, Bending moments, Prediction analysis techniques.

For abstract, see STAR 1213

N74-22584/8GA PC$12.50
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
PUBLICATIONS OF THE JET PROPULSION LABORATORY, JANUARY - DECEMBER 1973.
1 Apr 74, 188p NASA-CR-138171, JPL-BIBL-39-15
Contract NAS7-100

Descriptors: *Bibliographies, *Deep space network, *Indexes (Documentation), Abstracts, Aerospace sciences.

For abstract, see STAR 1213

22B. Spacecraft

AD-780 724/1GA PC$3.00/MF$1.45
Royal Aircraft Establishment Farnborough (England)
SPACE VEHICLES LAUNCHED DURING 1973.
Technical memo.,
J. A. Pilkington. Jan 74, 11p Rept no. RAE-TN-Space-205 DRIC-BR-39758
See also AD-763 024.

Descriptors: *Spacecraft, Tables(Data), Lunar craft, Satellites(Artificial), Manned spacecraft, Space probes, Orbits, Interplanetary trajectories, Apogee, Perigee, Great Britain.

RAE technical report 73006 (AD-763 024) lists all space vehicles launched before 31 December 1972. The memorandum extends the tabulation to the end of 1973, and gives some amendments to Technical Report 73006. (Author)

AD-781 146/6GA PC$4.50/MF$1.45
General Research Corp Santa Barbara Calif
PHOTOMETRIC ANALYSIS TECHNIQUES STUDY.
Final rept. 1 Jul 73-25 Feb 74,

R. G. Utley, and H. S. Ostrowsky. Jul 74, 105p
Rept no. GRC-CR-2-456 SAMSO-TR-74-100
Contract F04701-73-C-0308

Descriptors: *Space surveillance systems, *Space objects, *Spectrum signatures, *Pattern recognition, Target recognition, Photometry.

The report describes some studies made on the application of pattern recognition techniques to the Space Object Identification (SOI) problem using passive photometric signature data. Both simulated and measured passive photometric data (primarily, the latter) on satellite objects were compared using a variety of techniques in both the time and frequency domains. Different sample spaces with dimensionalities ranging from 14 to 50 were tested, with Principal Components Analysis being used in an effort to reduce the effective number of dimensions to a small subset with minimal loss of information. The GRC Mode Determination algorithm was then applied to the sample points in the reduced subsets to compare data from the different satellite/observer pairs in order to ascertain the extent to which this type of data processing is able to separate objects which are different and group together those which are in fact similar. (Modified author abstract)

N74-22099/7GA PC$7.00/MF$1.45
Alabama Univ., Huntsville. Bureau of Engineering Research.
ACTIVE CONTROL OF PRIMARY MIRROR OF AN ORBITING TELESCOPE WITH THERMAL EXCITATION.
Final Report.
J. L. Hill, and J. N. Youngblood. Mar 74, 76p
NASA-CR-120214, BER-171-09
Contract NAS8-28019

Descriptors: *Mirrors, *Spaceborne telescopes, Computer programs, Error analysis, Excitation, Mechanical properties, Surface properties, Thermodynamic properties.

For abstract, see STAR 1213

N74-22126/8GA PC$4.75/MF$1.45
Arbeitsgruppe fuer Physikalische Weltraumforschung, Freiburg (West Germany).
MODEL COMPUTATIONS AND MEASUREMENTS CONCERNING THE AEROS-EUV SPECTROMETER MODELLRECHNUNGEN UND MESSUNGEN ZUM AEROS-EUV SPEKTROMETER.
G. Schmidtke, K. Schmidt, and C. Rebstock. Nov 73, 31p BMFT-FBW-73-20
Subm-Sponsored by Bundesmin. Fuer Forsch. Und Technol.
In German; English Summary.

Descriptors: *Aeros satellite, *Pointing control systems, *Satellite rotation, *Ultraviolet spectrometers, Models, Spin, Ultraviolet spectra.

For abstract, see STAR 1213

N74-22441/1GA PC$5.25/MF$1.45
Smithsonian Astrophysical Observatory, Cambridge, Mass.
SATELLITE-TRACKING AND EARTH-DYNAMICS RESEARCH PROGRAMS.
Semiannual Progress Report, 1 Jul. - 31 Dec. 1973.
G. C. Weiffenbach. 31 Dec 73, 41p NASA-CR-138161, SAO-404-060
Contract NGR-09-015-002

Descriptors: *Atmospherics, *Earth satellites, *Geophysics, *Peole satellites, *Satellite tracking, Arizona, Brazil, Gravity gradient satellites, Peru, South africa, Zonal harmonics.

For abstract, see STAR 1213

N74-22495/7GA PC$6.50/MF$1.45
Baganoff Associates, Inc., St. Louis, Mo.
SKYLAB 2 GROUND WINDS DATA REDUCTION AND STATISTICAL ANALYSIS.
Final Report, 8 Jan. 1973 - 8 Jan. 1974.
18 Jan 74, 67p NASA-CR-120208, REPT-610
Contract NAS8-26703

Descriptors: *Skylab program, *Spacecraft configurations, *Wind effects, *Wind pressure, *Wind tunnel tests, Air flow, Data acquisition, Data processing, Pressure distribution.

For abstract, see STAR 1213

N74-22498/1GA PC$10.75/MF$1.45
Chrysler Corp., New Orleans, La. Space Div.
EFFECTS OF SURFACE ROUGHNESS ON THE AERODYNAMIC CHARACTERISTICS OF THE MODIFIED 089 B SHUTTLE ORBITER AT MACH 6 (LA15).
G. Ashby, Jr.. Feb 74, 154p NASA-CR-134083, DMS-DR-2079
Contract NAS9-13247

Descriptors: *Pressure distribution, *Space shuttle orbiters, *Surface properties, *Wind tunnel tests, Aerodynamic characteristics, Aerodynamic configurations, Hypersonic speed.

For abstract, see STAR 1213

N74-22502/0GA PC$6.50/MF$1.45
Lockheed Missiles and Space Co., Sunnyvale, Calif.
STRUCTURAL EVALUATION OF CANDIDATE SPACE SHUTTLE THERMAL PROTECTION SYSTEMS.
Final Report.
A. B. Burns. 26 Jun 72, 66p NASA-CR-132428, LMSC-D157398
Contract NAS1-11153

Descriptors: *Composite materials, *Silicon carbides, *Space shuttles, *Thermal control coatings, *Thermal protection, Adhesive bonding, Materials tests, Mechanical properties, Thermodynamic properties.

For abstract, see STAR 1213

N74-22503/8GA PC$9.25/MF$1.45
Chrysler Corp., New Orleans, La. Space Div.
RESULTS OF INVESTIGATIONS ON A 0.010-SCALE MODEL OF THE CONFIGURATION 3 SPACE SHUTTLE ORBITER AND EXTERNAL TANK IN THE NASA/AMES RESEARCH CENTER 3.5-FOOT HYPERSONIC WIND TUNNEL (IA15).
M. T. Petrozzi, M. D. Milam, and J. A. Mellenthin. Mar 74, 123p NASA-CR-134089, DMS-DR-2102
Contract NAS9-13247

Descriptors: *Hypersonic wind tunnels, *Space shuttle orbiters, *Wind tunnel models, *Wind tunnel stability tests, Lateral stability, Longitudinal stability, Spacecraft configurations.

For abstract, see STAR 1213

N74-22505/3GA PC$32.50/MF$1.45
Chrysler Corp., New Orleans, La. Space Div.
RESULTS OF INVESTIGATIONS ON AN 0.015-SCALE CONFIGURATION 140A/B SPACE SHUTTLE VEHICLE ORBITER MODEL (49-0) IN THE NASA/LANGLEY RESEARCH CENTER 8-FOOT TRANSONIC PRESSURE TUNNEL (OA25).
M. E. Nichols. Feb 74, 590p NASA-CR-134082, DMS-DR-2089
Contract NAS9-13247

Descriptors: *Space shuttles, *Spacecraft configurations, *Transonic speed, *Wind tunnel models, *Wind tunnel tests, Flight control, Lateral stability, Longitudinal stability, Spacecraft performance.

For abstract, see STAR 1213

N74-22506/1GA PC$4.50/MF$1.45
National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.
APOLLO EXPERIENCE REPORT THE COMMAND AND SERVICE MODULE MILESTONE REVIEW PROCESS.
H. L. Brendle, and J. A. York. Mar 74, 111p
NASA-TN-D-7599, JSC-S-389

Descriptors: *Apollo spacecraft, *Command modules, *Configuration management, *Service modules, *Spacecraft components, Reliability analysis, Spacecraft design, Systems engineering.

For abstract, see STAR 1213

N74-22508/7GA PC$10.75/MF$1.45
Chrysler Corp., New Orleans, La. Data Management Services.
WIND TUNNEL TEST RESULTS OF FAIRINGS ON A .004 SCALE MODEL ROCKWELL SPACE SHUTTLE INTEGRATED VEHICLE AERODYNAMIC CHARACTERISTICS AT MACH NUMBERS FROM 0.6 TO 4.96.
E. Allen, and T. Hamilton. Mar 74, 153p NASA-CR-134094, DMS-DR-2103
Contract NAS9-13247

Descriptors: *Space shuttles, *Spacecraft configurations, *Static aerodynamic characteristics, *Wind tunnel models, Aerodynamic forces, Stability derivatives, Wind tunnel stability tests.

For abstract, see STAR 1213

N74-22511/1GA PC$4.00/MF$1.45
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
COMPUTER-AIDED SPACE SHUTTLE ORBITER WING DESIGN STUDY.
W. P. Phillips, J. P. Decker, T. R. Rau, and C. R. Glatt. May 74, 84p NASA-TN-D-7478, L-9099

Descriptors: *Space shuttle orbiters, *Spacecraft configurations, *Spacecraft design, *Wing planforms, Hypersonic wind tunnels, Spacecraft performance, Wind tunnel tests.

For abstract, see STAR 1213

N74-22589/7GA PC$4.00/MF$1.45
Scientific Translation Service, Santa Barbara, Calif.
SPACE INVESTIGATIONS: THEIR EFFECT ON SCIENCE AND TECHNOLOGY.
N. Novokshchenov. Apr 74, 11p NASA-TT-F-15525
Contract NASW-2483
Tran-Transl. Into English from Aviats. I Kosmonavtika (Ussr), No. 1, 1974 p 36-37.

Descriptors: *Aerospace sciences, *Technology utilization, Artificial satellites, Space law, Television systems.

For abstract, see STAR 1213

PATENT-3 807 656 Not available NTIS
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
AIRLOCK.
Patent.
H. R. Linderfelt. Patented 30 Apr 74, 20p NASA-CASE-MFS-20922-1,
Misc-Filed 24 Jan. 1972. Subm-Sponsored by NASA.
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Air locks, *Pneumatic equipment, *Spacecraft components, *Valves, *Waste disposal, Equipment specifications, *Patents, Product development.

An airlock for use in transferring waste objects from a positively pressurized enclosure aboard an operative space vehicle, to a waste receiver attached to the vehicle and maintained at the negative pressure of a celestial space environment. The airlock is characterized by a shell having an internal chamber and hermetically sealed within an opening formed in a bulkhead of the enclosure. The shell is provided with an insertion hatch adjacent to the enclosure, and an ejection hatch adjacent the waste receiver, each of the hatches being hermetically sealed by a hatch cover supported for deployment to a hatch-opening disposition through a manipulation of a hatch-deploying mechanism. A three-way selector valve is coupled with the deploying mechanism and ported to an internal chamber of the shell, the enclosure, and the environment and is provided for alternately coupling the chamber with the enclosure and the receiver, in direct communication, in response to a manipulation of the mechanism whereby a sequence is imposed on the operation of the airlock.

22C. Spacecraft Trajectories and Reentry

AD-780 790/2GA PC$3.00/MF$1.45
Naval Weapons Lab Dahlgren Va
THE ADEQUACY OF STANDARD WEATHER IN ORBIT DETERMINATION.
Technical rept.,
Patrick James Fell. Apr 74, 19p Rept no. NWL-TR-3105

Descriptors: *Satellite tracking systems, *Radiofrequency interference, *Earth orbits, Weather, Corrections, Atmospheric refraction.
Identifiers: TRANSIT satellites.

Comparison of TRANSIT satellite orbits computed from Geoceiver observations using both real and NWL standard surface weather reveals maximum orbit differences of less than 2.0 meters. Furthermore, the introduction of refraction bias parameters into the orbit solutions can significantly increase solution accuracies. The results indicate that standard weather used in the NWL tropospheric refraction model with refraction bias parameters is adequate for orbit determination. (Author)

N74-21900/7GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
TESTING A SATELLITE AUTOMATIC NUTATION CONTROL SYSTEM.
J. A. Hrasiar. May 74, 19p NASA-TN-D-7596, G-7426

Descriptors: *Meteorological satellites, *Nutation, Automatic control, Satellite control, Synchronous satellites.

For abstract, see STAR 1213

N74-22475/9GA PC$10.50/MF$1.45
Kanner (Leo) Associates, Redwood City, Calif.
SPACE RESEARCH IN THE UKRAINE. PART 2: SPACE MECHANICS AND CONTROL SYSTEMS.
Y. A. Mitropolskiy. May 74, 147p NASA-TT-F-15536
Contract NASW-2481
Tran-Transl. Into English of the Book "Kosmicheskiye Issledovaniya NA Ukraine. Vypusk 2, Kosmicheskaya Mekhanika I Upravlyayushchiye Sistemy" Kiev, Naukova Dumka, 1973 p 1-91.

Descriptors: *Aerospace engineering, *Spacecraft control, *U.s.s.r., Aerodynamics, Artificial satellites, Attitude stability, Trajectory analysis.

For abstract, see STAR 1213

N74-22477/5GA PC$5.25/MF$1.45
LTV Aerospace Corp., Dallas, Tex.
STATISTICAL TRAJECTORY ESTIMATION PROGRAM (STEP) IMPLEMENTATION FOR BLDT POST FLIGHT TRAJECTORY SIMULATION.
W. E. Shields. 1973, 44p 0NASA-CR-1324270
Contract 0NAS1-109000

Descriptors: *Atmospheric entry simulation, *Mars probes, *Trajectory analysis, *Viking lander spacecraft, Attitude indicators, Brakes (For arresting motion), Computer programs, Descent trajectories.

For abstract, see STAR 1213

N74-22482/5GA PC$4.00/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
DOPPLER FACTORS IN SATELLITE-TO-SATELLITE TRACKING.
J. W. Marini. Apr 74, 18p 0NASA-TM-X-70638, 0X-932-74-93

Descriptors: *Doppler effect, *Relativistic effects, *Satellite tracking, Mathematical models, Transformations (Mathematics).

For abstract, see STAR 1213

N74-22483/3GA PC$4.75/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
THE 13TH ORDER RESONANCE FROM NAVY TRACKING ON A DIADEME 2 FRAGMENT.
C. A. Wagner. Mar 74, 34p 0NASA-TM-X-70636, 0X-920-74-88
Subm-Submitted for Publication.

Descriptors: *Diademe satellites, *Resonance, *Satellite orbits, *Satellite tracking, Decay, Geopotential, Orbital mechanics, Space surveillance (Ground based).

For abstract, see STAR 1213

N74-22484/1GA PC$6.00/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
STUDIES OF THE MAJOR PLANET SATELLITE SYSTEMS.
H. Frey, and P. D. Lowman. Apr 74, 57p 0NASA-TM-X-70642, 0X-922-74-112
Subm-Submitted for Publication.

Descriptors: *Natural satellites, *Orbital mechanics, *Solar system, Flyby missions, Graphs (Charts), Jupiter (Planet), Neptune (Planet), Pluto (Planet), Saturn (Planet), Tables (Data), Uranus (Planet).

For abstract, see STAR 1213

N74-22512/9GA PC$4.75/MF$1.45
Royal Observatory, Edinburgh (Scotland). Satellite Tracking Section.
STOPWATCH OBSERVATIONS OF SATELLITES. NOVEMBER 1973.
R. D. Eberst. 12 Dec 73, 35p 0ROE-STS-1630

Descriptors: *Cosmos satellites, *Optical tracking, *Satellite tracking, Ariel 4 satellite, Astronomical coordinates, Explorer satellites, Nimbus 4 satellite, Ogo, Skylab 1, Skylab 2, Skylab 3, Skylab 4, Td-1 satellite, Transit satellites.

For abstract, see STAR 1213

N74-22513/7GA PC$5.25/MF$1.45
Royal Observatory, Edinburgh (Scotland). Satellite Tracking Section.
ROTADOT OBSERVATIONS MADE AT EARLYBURN. OCTOBER 1973.
K. S. Russell. 25 Jan 74, 41p 0ROE-STS-1640

Descriptors: *Artificial satellites, *Optical tracking, *Satellite tracking, Azimuth, Data recorders, Elevation angle, Great britain, Transit time.

For abstract, see STAR 1213

REPORT LOCATOR LIST

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All of the reports announced in this issue are indexed by corporate author, subject, personal author, contract number, and accession/report number in the companion index **Volume 74, Number 17.**

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09A BDX-613-887(Rev.)
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20B	COO-1790-6
07D	COO-2092-29
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20H	COO-3071-67
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20L	COO-3151-37
20L	COO-3158-27
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20L	COO-3331-6
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11B	COO-3420-3
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20H	DESY-74-1
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18E	DOCKET-50282-229
18E	DOCKET-50409-111
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08G	E74-10520
08H	E74-10546
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20L	FRNC-TH-448
07D	FRNC-TH-467
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18E	HEDL-SA-630
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18E	HEDL-SA-651
18E	HEDL-SA-699
18E	HEDL-SA-700
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20H	HU-TFT-73-26
20H	HU-TFT-73-28
20M	HU-TFT-73-29
20H	HU-TFT-73-30
20H	HU-TFT-73-31
07D	HU-TFT-73-34
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18N	HW-83980
18J	HW-84611
07D	IAE-2256
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20H	IFVE-STF-73-59
20H	IFVE-STF-73-79
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20H	INP-860
20H	INR-1448
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20G	INS-TS-9
20G	IPPJ-168
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07D	IS-T-610
13B	IS-T-611
11F	IS-T-629
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20L	ITF-73-156-P
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18E	JAERI-M-5360
18E	JAERI-M-5368
18D	JAERI-M-5374
18E	JAERI-M-5421
18E	JAPFNR-144
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13E	JUL-1011-RW
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09B	KFK-EXT-8-73-3
09B	KFK-EXT-8-73-4
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18K	KFK-1890
18E	KFK-1913
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09B	KFK-1926
20L	KFKI-72-61
18E	KURRI-TR-111
07D	KY-653
12B	LA-DC-72-745
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19D	LA-UR-73-1297
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09B	LA-5408-MS
07D	LA-5429
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19A	MHSMP-74-5-K
19A	MHSMP-74-5-L
19A	MHSMP-74-5-M
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